L. HURLEY & C. A. BREWTON.

GRADUATED MOLD CAP AUXILIARY AND MOVABLE LINER.

APPLICATION FILED MAR. 22, 1911.

1,004,030. Patented Sept. 26, 1911.

Fig. 1.

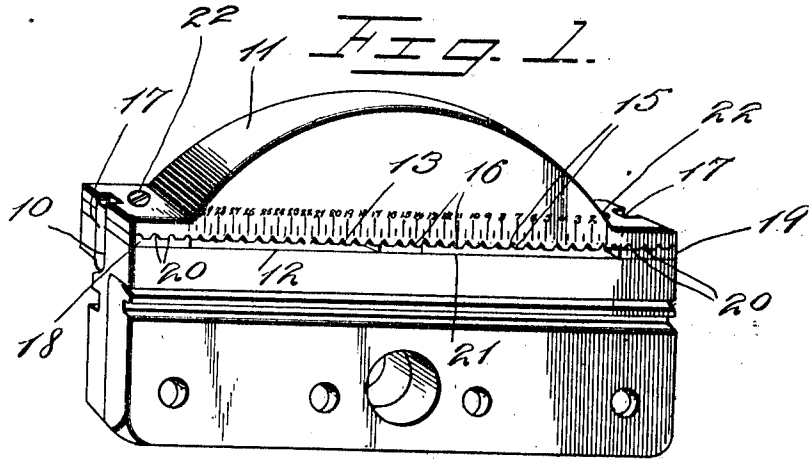


Fig. 2.

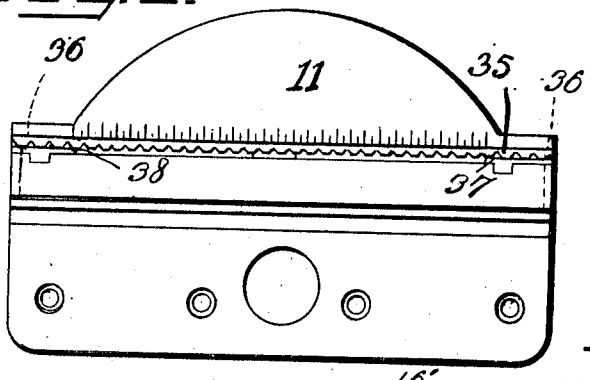


Fig. 4.

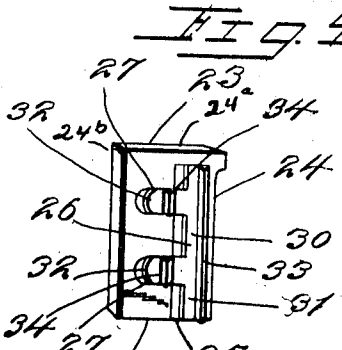
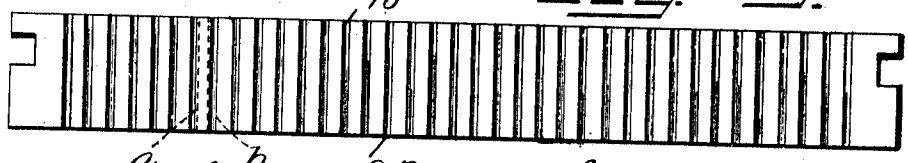


Fig. 3.



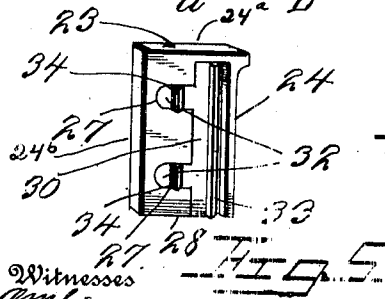


Fig. 5.

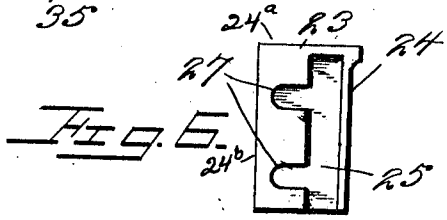


Fig. 6.

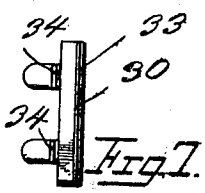


Fig. 7.

Witnesses

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UNITED STATES PATENT OFFICE.

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GRADUATED MOLD-CAP AUXILIARY AND MOVABLE LINER.

1,004,030. Specification of Letters Patent. Patented Sept. 26, 1911.

Application filed March 22, 1911. Serial No. 616,206.

To all whom it may concern:

Be it known that we, LAWRENCE HURLEY and CHARLES A. BREWTON, citizens of the United States, residing at Washington, in the District of Columbia, have invented new and useful Improvements in Graduated Mold-Cap Auxiliary and Movable Liners, of which the following is a specification.

This invention relates to type bar or slug casting machines, and has for its object to provide an inexpensive, efficient and durable means for adjusting the length of the mold. The drawings illustrate its application particularly to the well known Mergenthaler linotype machine now in general use in printing offices in this country.

It is an important object of the invention to provide such adjusting means adapted to be used with the several forms of mold now in use on the Mergenthaler machines, without requiring structural modifications thereof, and without changes in their operation or manipulation.

In the Mergenthaler machine, the slug, or "linotype" is cast in a disk-like mold wheel having a mold therein opening on both sides of the disk and disposed at right angles to a radius of the axis of the wheel. Improvements have been made in many different ways to accomplish adjustment of the slot to form slugs of various lengths and thicknesses. These have included central liners adjustable in length and adapted to be engaged in the mold to limit its length; molds, the sides of which are movable relatively, liners sliding longitudinally in the mold slot, and sets of block liners adapted to be secured at one end of the mold each of a length necessary to limit the slot to the size of a respective standard sized slug. As combining accuracy in producing slugs of proper size, simplicity of adjustment, simplicity and economy in manufacture, and a minimum depreciation in efficiency through wear, it has been found desirable by the makers of the Mergenthaler machine to use a mold comprising relatively movable cap and bottom plates carried by the mold wheel, and solid liners of various lengths and thicknesses. This construction is followed at this date, and will be familiar to those versed in the art. Owing to the large number of liners required under this system to form the various lengths of slugs usually required in printing offices, a complete equipment thereof costs several hundred dollars, as they cost one dollar or more each.

It is therefore an aim of this invention to provide a single liner element of simple form adapted to be used in conjunction with the usual end liners, or to be substituted for one of the latter, to be clamped between the mold plates in the customary manner employed with the special length liners, to form slugs of any desired standard length; and which may be manufactured at a cost but little in excess of that of a single one of the liners now customarily employed. This device may be termed a "movable liner."

It is an end of the invention to obviate the necessity for special mechanism or special tools in changing the mold to vary the slug length.

A further object is to form a slug with ribs so spaced as to provide a sufficient number even on the shortest slug, to insure the proper alinement of the slug when locked in the form. It is the case with slugs from the molds generally used, on which these ribs are widely spaced, that when a short slug is formed a considerable part at one end is left without a rib, and locked with adjacent slugs the end without a rib is likely to be forced out of line, a fault overcome under our method.

Another object is to utilize the rib-forming grooves of the mold to perform the function of retaining the movable liner in its various positions.

As it is undesirable to have the ribs on a slug formed at intervals less than one pica, and as it is often necessary to cast a line measured in units of half a pica—or nonpareil—it is a further object to so form the movable liner that while being positively positioned by engagement with the pica spaced rib grooves, it may be utilized to alternately form slugs terminating at or intermediately of the pica unit intervals.

Prior liners, adjustable in length, have usually involved the objectionable feature that when lengthened interstices are formed, into which the molten metal is admitted, clogging the liner parts and involving labor in cleaning before a change may be made. It is an advantage of our invention that such objection is overcome by the incorporation of movable means within the boundary of a liner of constant dimensions to control its position at slight intervals whereby

no openings are exposed to the molten type metal.

It is a valuable feature of the invention that by so spacing the grooves, and forming the movable liner so as to coöperate therewith, the operator will have a positive indication in the mold itself of the proper point at which to dispose the limiting device—the movable liner—without the use of a rule or other measuring appliance separate from the mold and similarly, the length of a slug may be be readily determined, by the number of ribs thereon, and the amount of material, if any, projecting beyond the last rib at one end, the other end rib being flush with the end of the slug. The generally adopted scale of line measurement is graduated in units of picas and half-picas, or nonpareil.

Other objects and advantages will be apparent from the following description, and from the drawings, in which,

Figure 1 is a front view of a mold assembled, with the present invention incorporated therein, and arranged for producing the maximum length of slug, measurable in picas; Fig. 2 is a similar view showing the old form of mold equipped with the invention, and adjusted to form a slug of reduced size measurable in units of nonpareil, or half-picas; Fig. 3 is a bottom view of the mold cap auxiliary for the old type; Fig. 4 is a plan of the "movable liner" in pica unit position; Fig. 5 is a similar view showing the movable liner in nonpareil position; Fig. 6 is a plan of the base member of the movable liner; Fig. 7 is a similar view of the differential plate of the movable liner.

There is shown in Fig. 1 a bottom mold plate 10 and a cap plate 11 of substantially the usual form, and adapted to be engaged in the usual form of mold wheel in the customary manner. The mold face 12 of the bottom plate is smooth and accurately planed, while the mold face 13 of the cap plate is provided with a multiplicity of transverse grooves 16 which may be shaped in any desirable transverse form, but which as shown are approximately V shaped and have equally inclined sides 15. The maximum width of the grooves at the front of the mold is a scant one-sixteenth of an inch and they are tapered to sligthly less than this at their inner ends. If desired, the bottom plate may be provided with the regular guide pins 17 at each end, adapted to engage in a mortise recess of the end liners 18 and 19, which in addition have ribs 20 conforming to and engaged snugly in the adjacent grooves 16. The liners 18 and 19 form the ends of the mold space or slot 21, and allow the formation of the maximum length of slug. They are clamped between the cap and bottom plates as heretofore by means of the screw bolts 22 engaged through each end of the cap plate and in suitable threaded openings in the bottom plate. Each is plain on its lower side, and provided on its upper side with two or more ribs the left hand liner to be removed when it is desired to limit the mold length to a slight extent less than the maximum length, as will be described. The standard size of the maximum mold length of the machines generally in use is 30 picas, although they may be adapted to cast larger lines by the use of our device.

To limit the size of the mold constructed in accordance with our invention to an extent of three picas or less, the bolts 22 may be loosened, the left end liner removed and a movable liner to be described, adjusted so that its ribs may engage the proper set of grooves to hold it at the desired distance from the opposite end liner. The left hand liner is preferably moved, and the right hand liner left undisturbed, to form the slug in proper position for ejection by the devices customarily employed. If the mold is to be shortened more than three picas the left end liner should be allowed to remain in place while the movable liner is adjusted inwardly thereof, for when the movable liner is intermediately located in the mold some of the passages through which the metal has access to the mold from the present pumping devices will then be located outwardly of the movable liner and a waste of metal would ensue if the end liner were not in place. The front side of this space between the left hand liner and the movable liner is closed by the left hand jaw of the matrix vise, which abuts snugly against the front of the mold slot when a cast is made, and is of sufficient size. It is automatically movable to engage lines of matrices of different lengths, whereby it is always properly positioned to close the forward side of the space between the movable and left hand liners. Therefore when the mold is to be shortened, we use a movable liner, comprising the base member 23, corresponding in thickness to the size of the type to be represented on the slug, the edge or mold face 24 of the liner forming the end wall of the mold space, when in proper position. The base has also a back face 24^a and an outer side face 24^b. As shown, the movable liner is three picas wide. It extends the full depth of the mold slot when in place, and is adapted to form a metal tight joint at the end of the line of matrices when held in position for the cast. The upper side of the member 23 is milled out to form a slot or recess 25, having a stem portion 26 parallel and very close to the mold face 24 of the liner, and having branches 27 extending inwardly at right angles to the stem and spaced inward of the ends of the stem. The slot is quite shallow,—although its depth may be

varied as desired—and the stem portion opens on the front face 28 of the liner body 23. It will be observed that the slot 25 is completely isolated from the mold face 24, the back face 24[a] and the outer side face 24[b], whereby access of type metal to the recess is prevented.

Disposed in the slot 25 there is a differential plate 30 conforming to the outline of the slot, but differing in size laterally in one direction—transversely of the stem. The stem 31 of the plate is narrower than the stem of the slot, and the arms 32 of the plate are shorter than the slot branches 27, although fitting snugly therein transversely of the arms. The difference in size is such as to allow reciprocation of the differential plate for a distance of half a pica. A rib 33, conforming in shape to the grooves 16, is formed at the outer edge of the stem 31, and similar ribs 34 are formed on the arms 32, in alinement with each other and spaced laterally from the rib 33 one pica. The ribs project above the face of the base member 23, so that when the joker is inserted in the mold slot, the ribs 33 and 34 engage adjacent grooves 16 and hold the movable liner with its mold side in proper parallelism with the grooves. It will be seen that when the device is thus engaged and the base member 23 is pressed outwardly against the differential plate, the slug will be cast in full pica measurement, while if the base be forced inwardly until checked by the differential plate, the amount of play being half a pica, the slug will be formed of a length measurable in units of nonpareil or half picas. This is of especial advantage in newspaper work, where the standard column is thirteen picas wide, and it is frequently necessary to divide the column, producing lines of six and one-half picas. The two stages of adjustment are shown in Figs. 4 and 5. Many similar situations are involved in casting smaller or larger lines. It is of course understood that the clamping means engaging the cap plate is loosened when the movable liner is to be adjusted, and tightened again to hold the liner in position. By the recess being opened on the front face of the mold the operator may see at a glance how the differential member is set in the base member.

To adapt the device to use upon the common form of Mergenthaler molds already in use, we have provided the mold cap auxiliary plate 35 illustrated in Figs. 2 and 3, which comprises a plate substantially rectangular in form, and of the same dimension in plan as the mold cap plate on its lower face, being mortised at each end to receive the alining or guide pins 17 at each end of the bottom plate. It is provided on one side with transverse grooves 16′ similar to those 16 before described, and in use is positioned over the regular right and left end liners 37 and 38 with the grooves on the lower side, the cap plate 11′ being then clamped thereover, after which the movable liner may be adjusted therein whenever desired. It will be understood of course that the proportions of the parts as illustrated may be changed and means utilized to secure the auxiliary cap plate to the regular cap plate more firmly, as may be found desirable.

In the use of the present solid liners of special length for each length of slug, damage is frequently done by operators failing to make the necessary change in the ejector device to accommodate it to the narrow slugs, and a too wide ejector coming against the special liner, either one or the other is damaged. Such liability is obviated by the use of the movable liner described, as this may be readily forced out by the ejector, without damage.

A special thickness of base member 23 of the movable liner will be required for each font of type, or each different thickness of slug to be cast, but the same differential plate may be used upon all the bases as may be understood by forming the slots of the same depth in all. The form of the slot or plate 30 is immaterial as long as the necessary play of half a pica is allowed between the base and differential plate.

What is claimed is:

1. In a device of the class described, the combination with a mold having opposed sides and an end forming means, and having spaced grooves on one side opening on the edge of the mold, of a movable liner adapted to engage snugly between the grooved side and the opposite side of the mold, and comprising a base member having a recess in one side to lie adjacent the grooved mold side, and a differential plate lying in the recess and having a rib portion projecting above the base member for engagement with the grooves, said differential plate being narrower than the recess in a direction transverse to the rib, and being reciprocable in that direction relatively to the base member.

2. The combination with a mold having transverse spaced grooves in one side, of a movable liner comprising a base member and a differential member movable thereon within the boundary of the base member, means for engaging the differential member against movement on the base member at certain positions, and a rib on the differential member for engagement with the grooves of the mold whereby a single groove may be engaged to positively position the liner to form slugs of different lengths.

3. The combination with a mold of the class described having transverse spaced grooves in one side, of a liner comprising

a base member having a mold face and an outer face and having a recess to be disposed adjacent the grooved side of the mold, said recess being isolated from the named faces of the base member, and a differential member adjustable in the recess and having a rib to engage the grooves of the mold, and adapted to engage the base member to limit it to positions spaced differently from said grooves.

4. In a device of the class described, the combination of a mold having separable side members, means for clamping the members in operative relation, and end forming means adapted to be clamped therebetween: one side having a plurality of grooves spaced at intervals corresponding to certain units of printers' measures, a liner member comprising a mold limiting portion and a differential member freely reciprocably engaged therewith, means to limit the movement of said member to a distance differing from that between the grooves, said member having portions thereon adapted to engage the grooves, whereby a single groove may be engaged to positively position the liner to form slugs of two different lengths alternatively.

5. In a device of the class described, the combination of a grooved mold side and a movable liner member comprising a base portion having a guide recess therein, and a differential plate freely reciprocable in the recess in one direction for a distance differing from that between the grooves of the mold side, and means on the differential plate for engaging the grooves against movement of the plate transversely thereof, for the purposes described.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

LAWRENCE HURLEY.
CHARLES A. BREWTON.

Witnesses:
PAUL F. GROVE,
H. L. WOODWARD.