Sept. 2, 1947. C. W. CURLE ET AL 2,426,727

TYPE SLUG END CUTTER

Original Filed Oct. 31, 1941 4 Sheets-Sheet 1

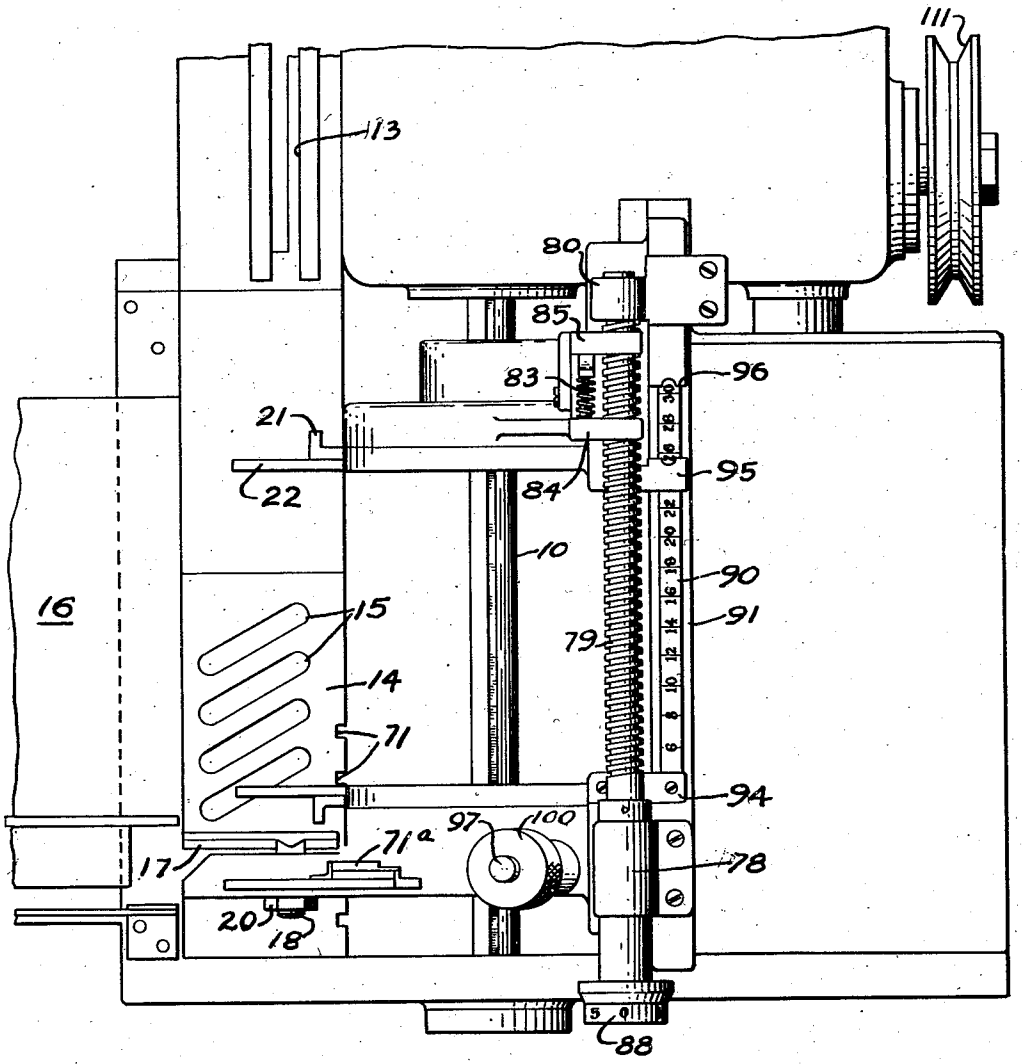


Fig 1

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TYPE SLUG END CUTTER

Original Filed Oct. 31, 1941 4 Sheets-Sheet 2

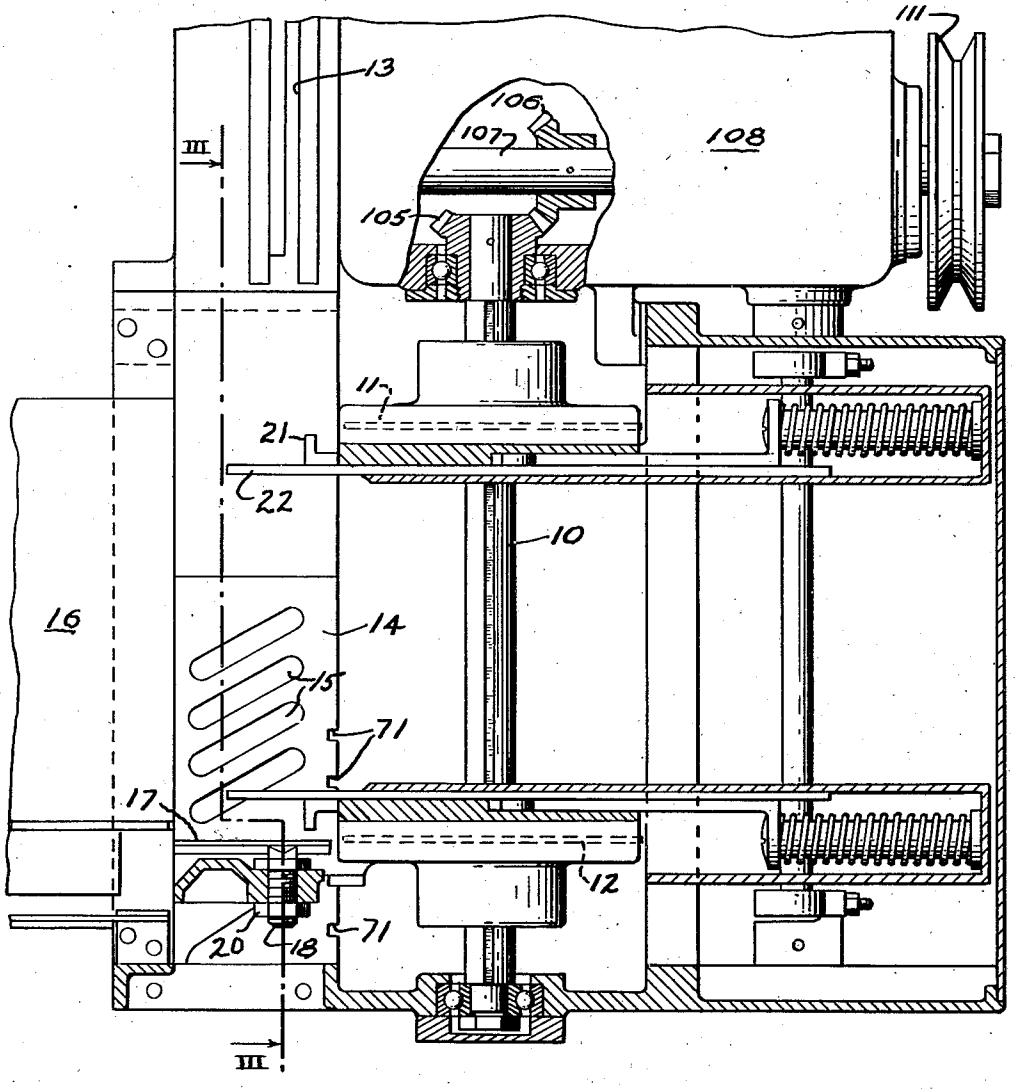


Fig 2

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TYPE SLUG END CUTTER

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Fig 3

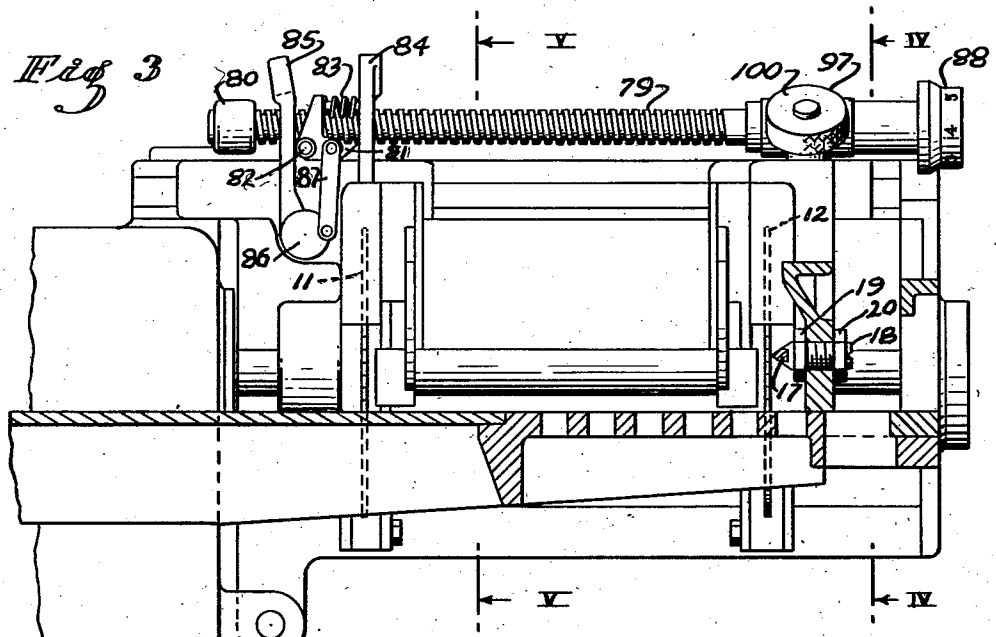
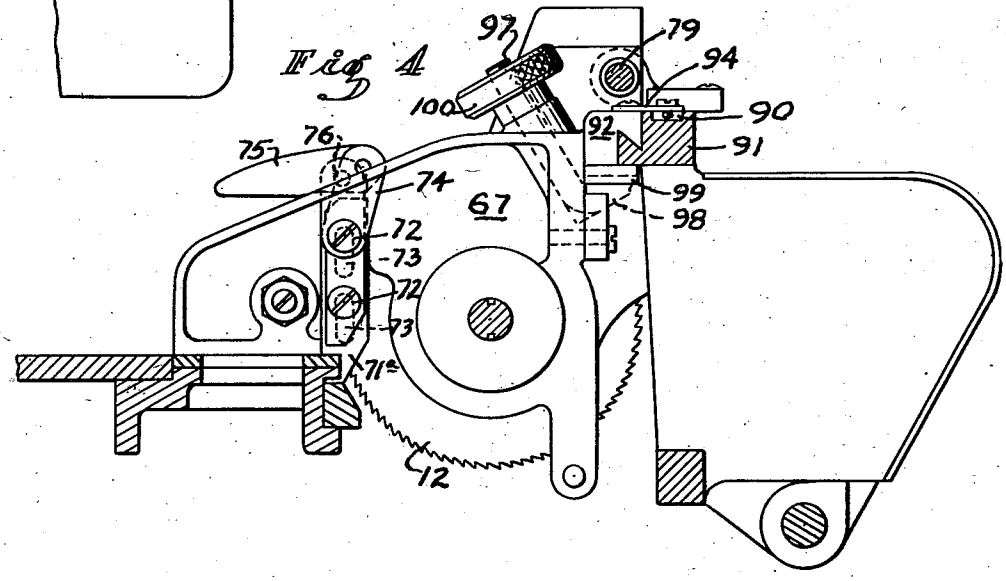


Fig 4



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Fig 5

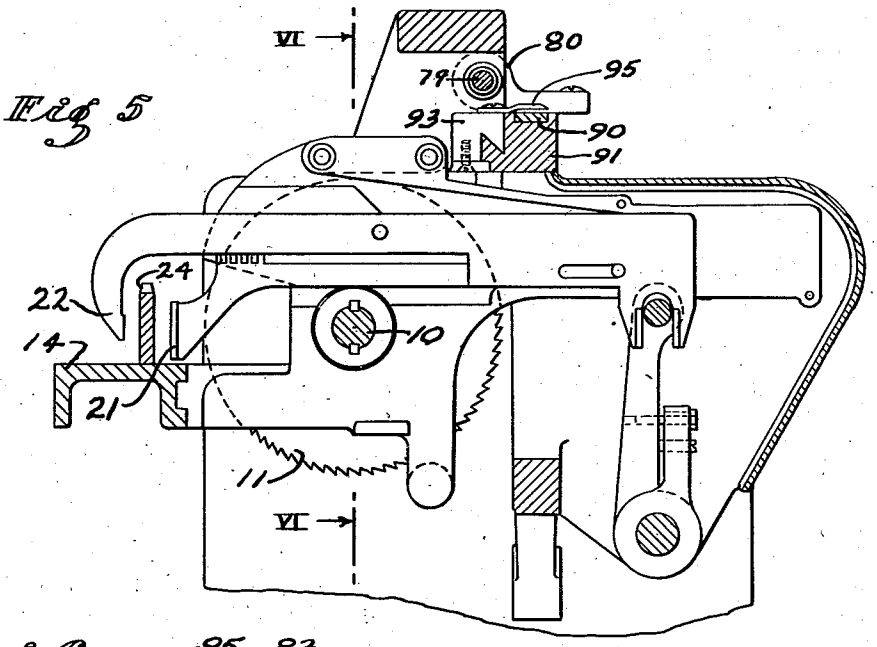
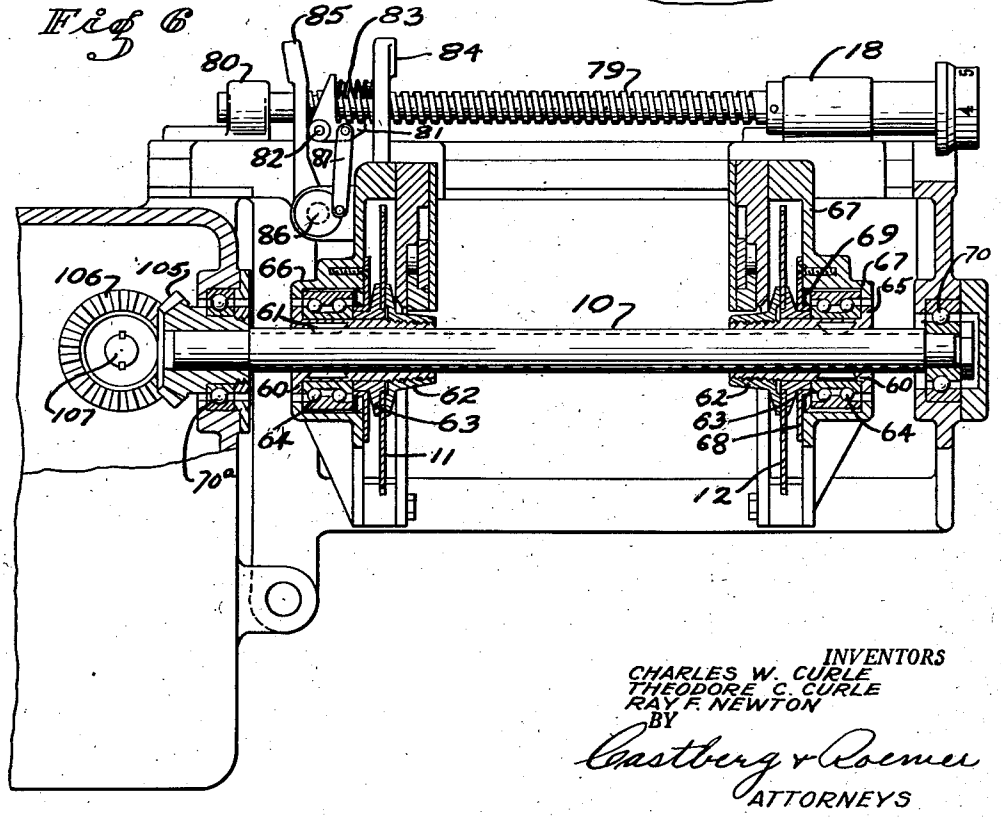


Fig 6



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Patented Sept. 2, 1947 2,426,727

UNITED STATES PATENT OFFICE

2,426,727

TYPE SLUG END CUTTER

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Original application October 31, 1941, Serial No. 417,348, now Patent No. 2,369,947, dated February 20, 1945. Divided and this application January 16, 1945, Serial No. 573,040

3 Claims. (Cl. 29—70)

1

The present invention relates to the trimming of type slugs as they issue from a line casting machine, and particularly to a machine for cutting off the ends of the slugs to make them square and parallel with each other, and to produce slugs of equal length.

The machine of the present invention is designed for operation in conjunction with a side trimmer and a low slugger of the types disclosed in our co-pending applications, entitled "Type slug side trimmer," filed October 31, 1941, Serial Number 417,346, now Patent No. 2,374,655, granted May 1, 1945, and "Type slug low slugger," filed October 31, 1941, Serial Number 417,347, now Patent No. 2,374,656, granted May 1, 1945, and this application is a division of our co-pending application entitled, "Type slug end cutter" filed October 31, 1941, Serial Number 417,348, now Patent No. 2,369,947, granted February 20, 1945. The mechanism disclosed herein is adapted, however for use with any slug trimming mechanism, or may if desired, be used independently of such mechanisms.

The application of which the present application is a division discloses an end cutter for type slugs embodying improved mechanism for gripping a slug presented to it, for drawing the slug into engagement with spaced cutter members, and thereafter for stacking the cut slug in a galley or the like.

It is the object of the present invention to provide a mounting for cutter members in a machine of the character described by means of which they will be readily adjustable with relation to each other to cut slugs of different length and with a high degree of accuracy.

A further object is the provision of means for adjusting both cutter members, one in steps to accommodate slugs of different lengths, and the other in small increments to produce an over-all length for the finished slug of any desired measurement.

A further object is the provision in a machine of this character of a mounting for cutter members therein which will accommodate a great many slugs presented to be cut in rapid succession and by automatic continuously operating slug presenting and discharging mechanism.

Further objects and advantages of the invention are made apparent in the following specification, wherein reference is made to the accompanying drawings, in which one form of the invention is illustrated in detail.

In the drawings—

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Fig. 1 is a plan view of the major portion of a machine embodying the present invention;

Fig. 2 is a similar view, with parts removed and parts in section, to illustrate certain features of construction;

Fig. 3 is a sectional view taken along line III—III of Fig. 2;

Fig. 4 is a sectional view taken along line IV—IV of Fig. 3;

Fig. 5 is a sectional view taken along line V—V of Fig. 3; and,

Fig. 6 is a sectional view taken along line VI—VI of Fig. 5.

Referring to Figs. 1, 2, and 6, the end cutter of the present invention is shown as comprising a shaft 10 which supports and drives a pair of spaced circular saws 11 and 12. The particular manner in which the saws are mounted and adjusted will be set forth in detail hereinafter. They may for the present be considered as rotating continuously and as spaced apart a predetermined distance so that a slug presented to them from a position parallel to the shaft 10 will be trimmed at both its ends.

A slug, issuing from a line casting machine, and usually having been previously subjected to side trimming and low slugging operations, descends by gravity or, preferably, by suitable slug advancing mechanism of the kind disclosed in our co-pending application entitled, "Type slug side trimmer," Serial Number 417,346, filed October 31, 1941, through a chute 13 (see Figs. 1 and 2) and comes to rest on a table 14 which is slotted as at 15 to permit the escape of chips formed as residue of the sawing operation.

The saws 11 and 12 are disposed to the right of the table 14 and to its left is a galley 16 upon which they issue from the line casting machine. As each slug is received by the table 14, it is brought to rest directly in front of the saws by engagement with a stop bar 17. This stop bar is formed as shown in Fig. 3, with a sharpened forward edge which cuts into the type metal of which the slug is formed, upon impact of the slug against it, in order to limit any tendency of the slug to rebound due to the impact. The stop bar 17 is mounted on a threaded stud 18 which may be adjusted and fixed in position by a pair of lock nuts 19 and 20.

Immediately after the slug comes to rest in front of the saws, it is gripped between two sets of clamping jaws, each set of which comprises a lower jaw 21 and an upper jaw 22. These clamping jaws first draw the slug toward the rotating circular saws which sever its ends to pro-

duce a slug of exact length predetermined by the spacing of the saws, then push it back over the table 14, release it, and deposit it on the galley 16.

The manner in which the jaws 21 and 22 are constructed and the manner in which they function is all clearly disclosed in application Serial Number 417,348 of which the present application is a division. It will suffice for an understanding of the invention herein disclosed to state that the function of jaws 21 and 22 is to grip each individual slug as it is presented between them to occupy the position wherein it is shown at 24 in Fig. 5 and then to draw the slug toward the cutters 11 and 12 which sever its ends after which the jaws discharge the slug from between the cutters and deposit it in a galley wherein it becomes a part of a stack of slugs previously so operated upon.

The length of the slug after it has been cut depends upon the spacing between the saws 11 and 12, so these saws are made adjustable, one to accommodate slugs cast in different sizes, and the other to determine the exact length of the finished slug. The saws are therefore both mounted for adjustment longitudinally of the shaft 10 by which they are rotated. The saw mountings are identical and each, as shown in Fig. 6, comprises a hollow mandrel 60 which is slidable on the shaft 10 and keyed thereto by keys 61 which extend into longitudinal splines in the shaft. There are preferably two such keys 61 in each mandrel diametrically opposed for balance. The saw blade is held on the mandrel by a nut 62 which clamps the blade against a collar 63. This collar is backed by the inner race of a ball bearing 64 which in turn backs against a flange 65 on the mandrel.

The outer race of the bearing 64 is enclosed by a housing 66 which is formed as an integral part of a guard casting 67 which covers and protects the saw blade. An annular plate 68 is secured by screws to the inside of the guard casting 67 and an annular marcelled spring 69, interposed between this plate and the outer race of the bearing 64, retains the bearing against endwise movement in its housing. The outer race of the bearing fits loosely within its housing, so that while the saws are accurately aligned by being mounted on the same shaft, the castings which guard them need not be supported with the same degree of accuracy, but may be moved radially for the distance of the space between the bearings 64 and the housing 66. Through this construction the saws may be adjusted longitudinally of the shaft 10 by moving the guard castings 67. The bearings 64 are designed to prevent thrust play during this adjustment and during operation of the saws, though the saws are actually supported for rotation by bearings 70 and 70*a* which mount the opposite ends of the shaft 10.

The saw 12 may be latched in several positions of adjustment, determined by spaced notches 71, (see Figs. 1 and 2) formed in the edge of the table 14. A sliding bolt 71*a* shown in Figs. 1 and 4, enters any one of these notches. The bolt 71*a* is carried by the saw guard casting 67 so as to prevent longitudinal movement of the casting relative to the shaft 10 when the bolt is engaged in one of the notches. The bolt 71*a* is provided with shoulder screws 72 which extend through slots 73 to permit it to slide vertically and a link 74 connects the bolt with a lever 75 pivoted to the casting as at 76, so that it may be manually manipulated to retract the bolt when

the saw is to be adjusted, and to advance the bolt into a notch for latching it in its adjusted position.

The adjustment of the saw just described is to set the machine to receive slugs of a given length, usually measured in increments of inches. The exact length to which the slug is to be trimmed by the operation of the saw is adjustable by movement of the other saw through the mechanism now to be described.

As shown in Figs. 1 and 6, the guard of the saw 12 supports a bearing 78 for one end of a threaded shaft 79, the other end of which is journalled in a bearing 80 supported by the framework of the machine independently of the saw 11. The guard of the saw 11 is latched to the threaded shaft 79 by a latch 81 (see Figs. 3 and 6) which has teeth registering with the threads on the shaft and which is pivoted relative to the guard at 82. A spring 83 is interposed between the tail of the latch and a handle 84 which extends upwardly from the saw guard normally to hold the latch engaged. A latch releasing lever 85 is pivoted at 86 and is connected by a link 87 with the latch 81, so that the handle 84 and lever 85 may be grasped simultaneously to withdraw the latch and to move the saw longitudinally of the shaft 10 while the latch is free of the threads on the shaft 79. This permits adjustment of the saw 11 in increments equal to the pitch of the threads on the shaft 79. To effect finer adjustments the shaft may be rotated by a graduated hand dial 88 secured to its end, thus gradually advancing or retracting the point of engagement between its threads and the notched latch 81.

The distance between the saws 11 and 12 is measured on a scale 90, shown in Figs. 1, 4 and 5, as slidable longitudinally on a rail 91 which is a rigid part of the frame of the machine. The saw 12 is guided along the rail 91 by a sliding connection between the rail and a block 92, shown in Fig. 4 as carried by the saw guard assembly. A similar block 93 (Fig. 5) guides the saw 11 along the rail 91. The block 92 carries a plate 94 screwed to the scale 90 so that adjustment of the saw 12 causes the scale to slide longitudinally of the rail 91. The block 93 carries a plate 95 which overlies the scale to form a reference line for determining the distance between the saws. When the lower saw 12 is adjusted, the upper end of the scale slides under a fixed reference line 96, which indicates the position to which it has been adjusted, and therefore indicates the length of slug the machine is set to receive. This movement of the scale when the saw 12 is adjusted also accommodates it to the saw 11, so that a true reading of the distance between saws may be taken directly from the position of the reference plate 95 at all times. The guard assembly of the saw 12 is preferably clamped in any position to which is has been adjusted by means of a bolt 97 (Fig. 4) which has a foot 98 at its lower end adapted to be drawn upwardly to cause a plate 99 to press against the under side of the rail 91, thus drawing the block 92 into firm engagement therewith. A knurled nut 100 is threaded to the bolt to draw it upwardly, and is of course loosened when the saw is to be adjusted along the rail.

The shaft 10 which rotates the saws 11 and 12 is continuously driven through a bevel gear 105 secured to its end, as shown in Fig. 2, and meshes with a similar gear 106 pinned to a shaft 107 which extends through a transmission hous-

ing 108. The shaft 107 is journalled in suitable bearings (not shown) and has an end extending through the housing to be driven by some suitable power source, such as an electric motor with which it may be connected as by a pulley 111 and a belt not shown.

Having thus described our invention, what we claim and desire to secure by Letters Patent is:

1. In a type slug end cutter, a pair of spaced saws, a single shaft for driving said saws, a guard housing for each saw embracing said shaft, a mandrel for each saw splined to the shaft for longitudinal adjustment thereon, a thrust bearing interposed between each mandrel and the saw guard, and housings for said bearings carried by the guards and of sufficiently greater diameter than the bearing to accommodate them if the guards are slightly eccentric to the shaft.

2. In a type slug end cutter, a pair of spaced saws mounted for adjustment to and away from each other, a housing for each saw arranged to be adjusted with the saw, a stop for positioning lugs to be cut by the saws carried by one saw housing, means to adjust the one saw with its housing and stop to accommodate slugs of different lengths, and means to adjust the other saw to determine the exact length to which the slugs are to be cut.

3. In a type slug end cutter, a pair of spaced saws, a single shaft for driving said saws, a mandrel for each saw splined to the shaft for longitudinal adjustment thereon, a guard for each saw, a thrust bearing interposed between each mandrel and guard whereby the saws may be adjusted longitudinally of the shaft by manipulation of the guards and housings on the guards inclosing said thrust bearings and sufficiently larger than the bearings to permit slight displacement of the guards radially of the shaft.

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The following references are of record in the file of this patent:

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Number	Country	Date
145,706	Austria	May 11, 1936

Certificate of Correction

Patent No. 2,426,727. September 2, 1947.

CHARLES W. CURLE ET AL.

It is hereby certified that errors appear in the printed specification of the above numbered patent requiring correction as follows: Column 2, line 38, after the word "which" insert *the slugs are stacked, after their ends are cut, in the order in which*; column 4, line 62, for "which is" read *which it*; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 25th day of November, A. D. 1947.

[SEAL]

THOMAS F. MURPHY,
Assistant Commissioner of Patents.