

Dec. 31, 1957

H. JACQUART
SLAB MARKING APPARATUS

2,818,014

Filed June 25, 1954

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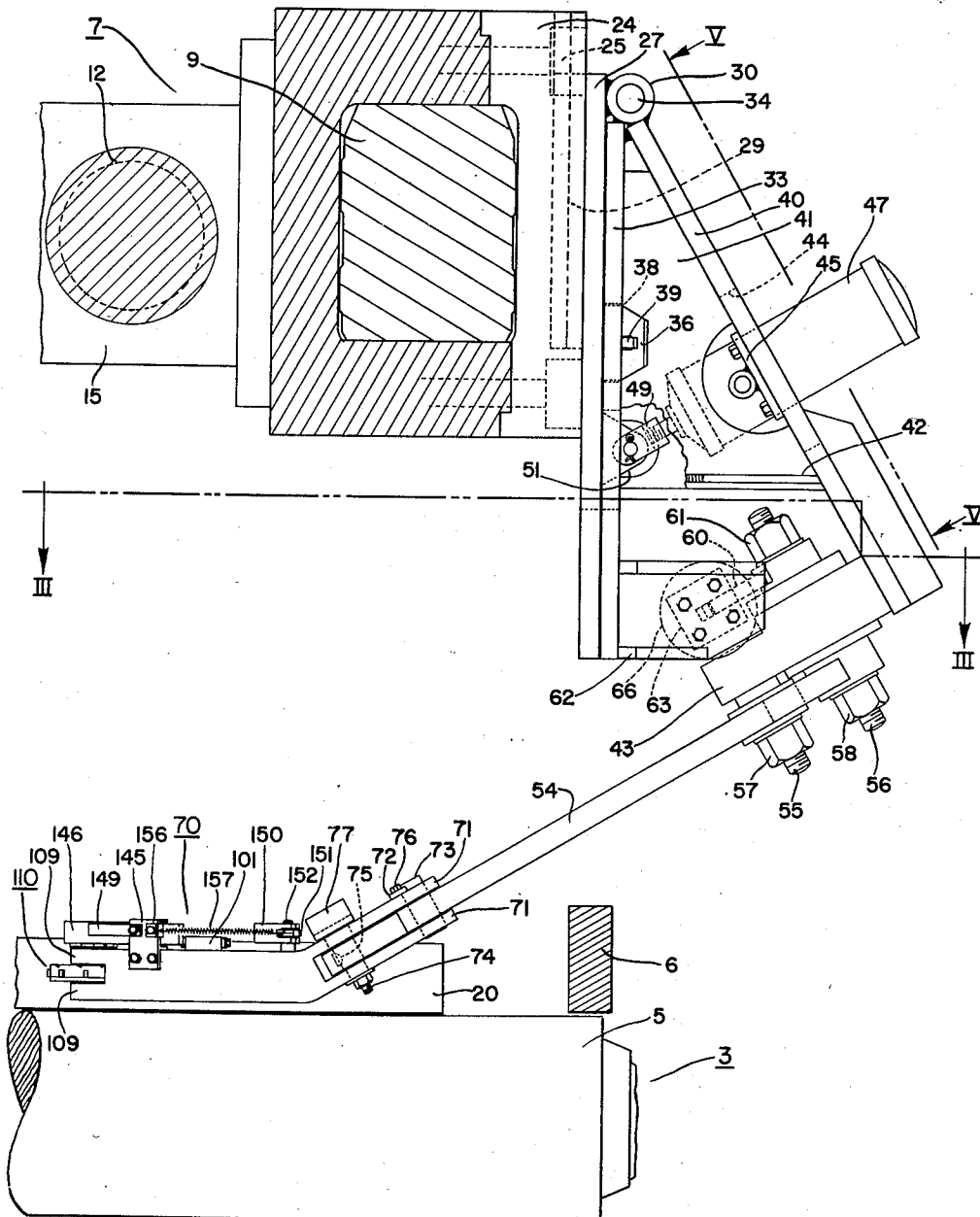


Fig. 2

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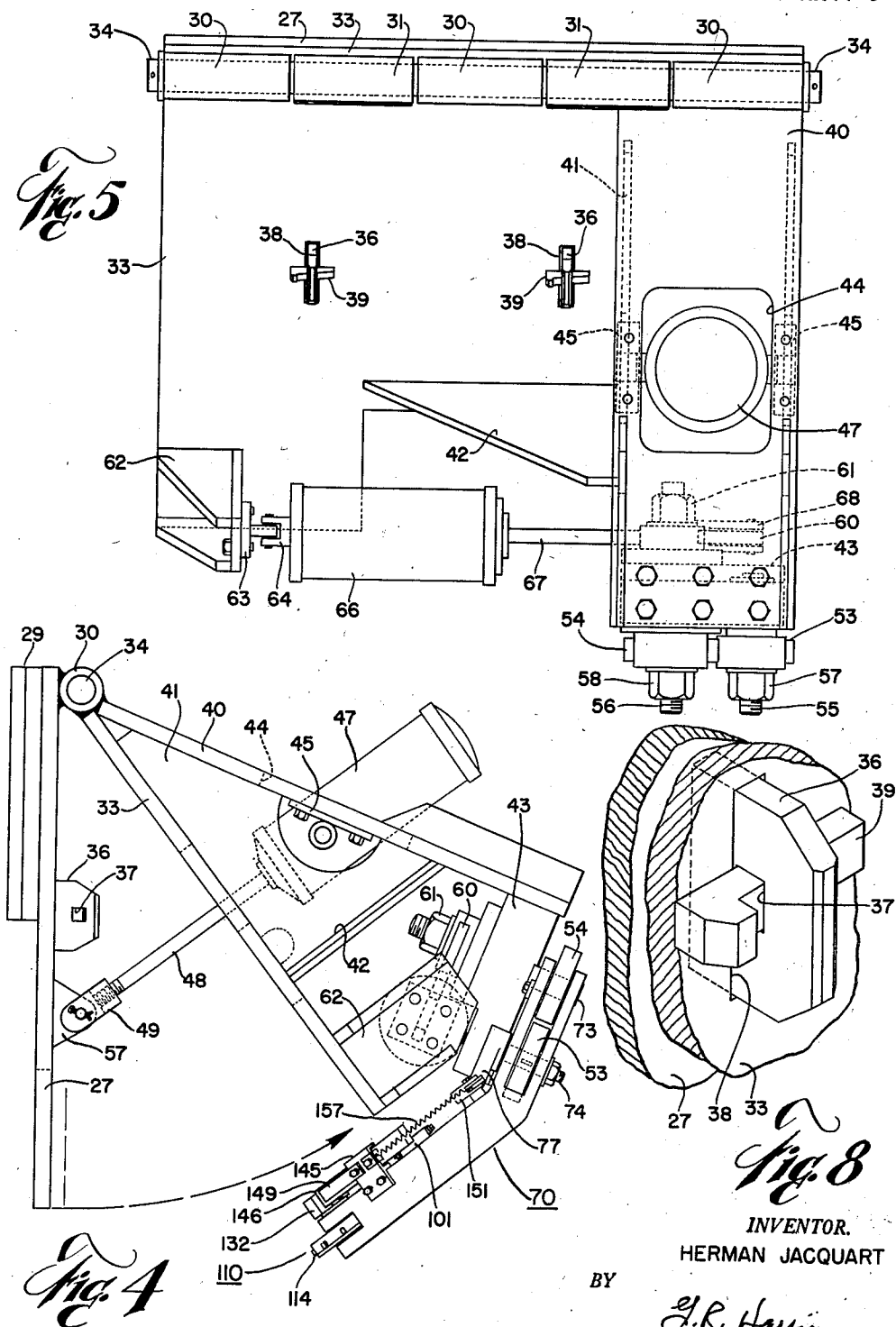
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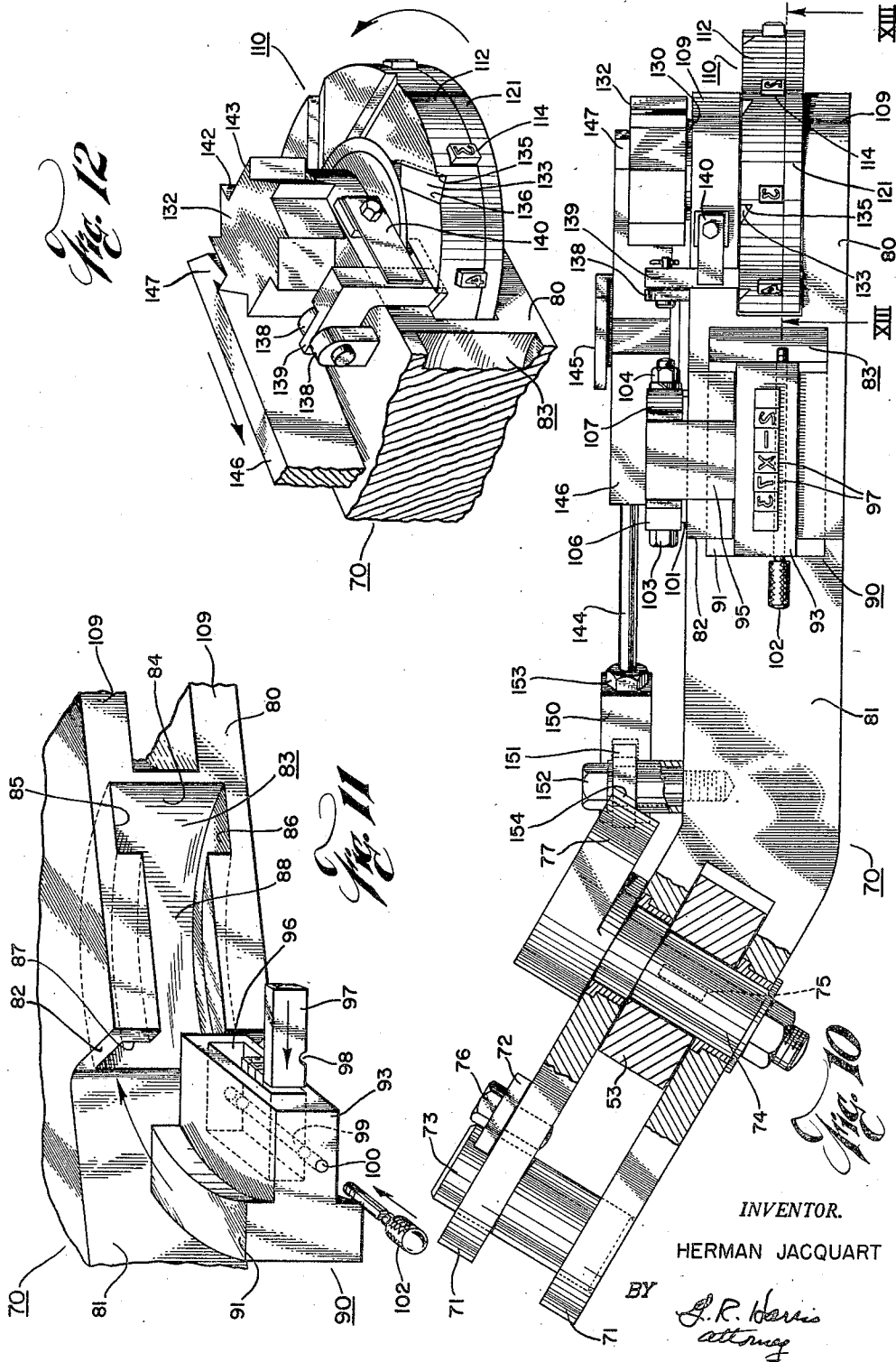
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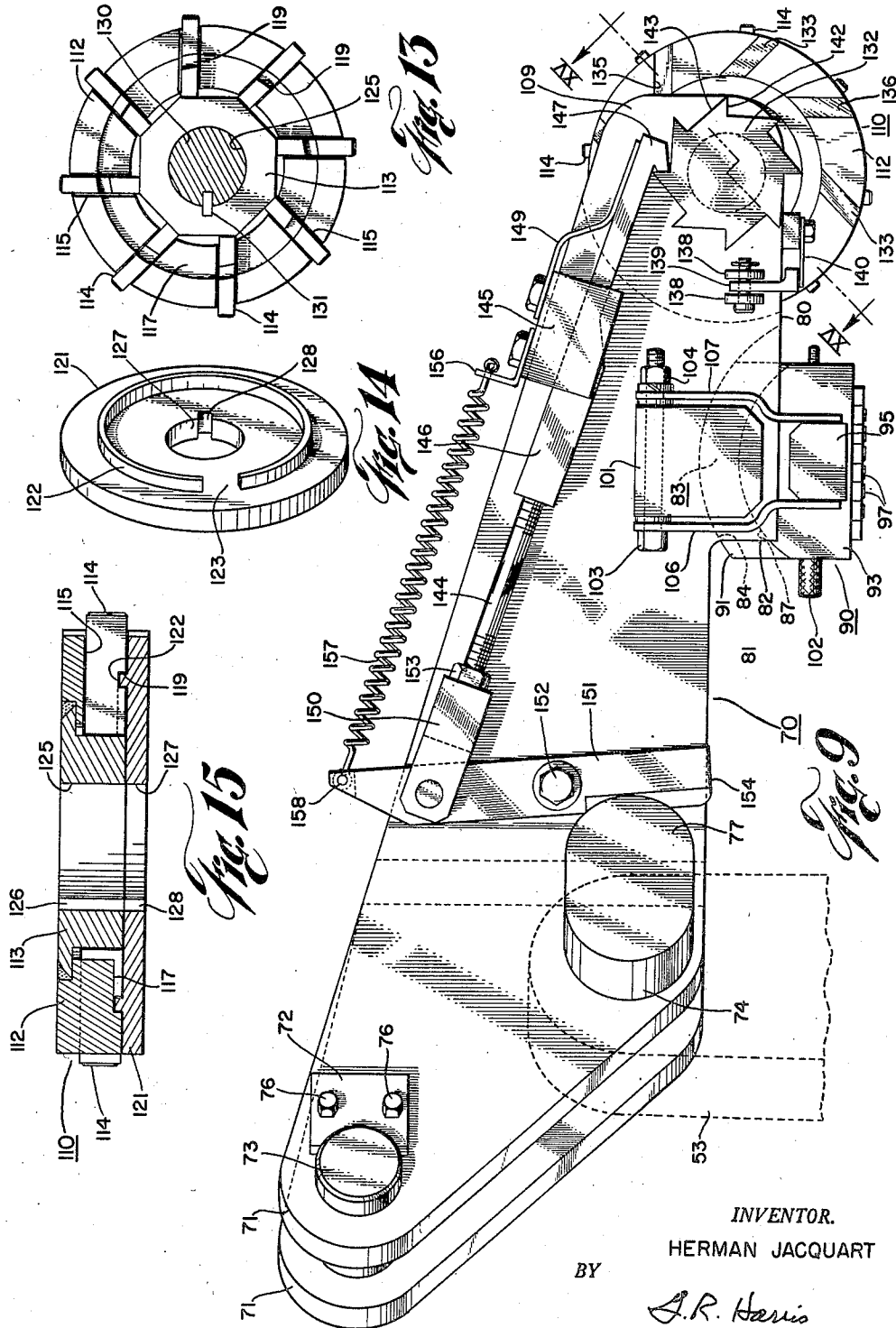
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2,818,014

SLAB MARKING APPARATUS

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Application June 25, 1954, Serial No. 439,429

9 Claims. (Cl. 101—4)

This invention relates to apparatus for marking identifying characters on rolled metal bodies such as slabs or blooms. It is more particularly concerned with automatic apparatus for such purpose which can be readily added to existing rolling mill apparatus. My invention is particularly adapted to the marking of hot-rolled steel slabs or blooms and will be described in this connection in the following paragraphs, but is also useful for marking rolled bodies of other metals.

A heat of steel made to a specified chemical analysis for a specific product is cast into a number of ingots, each of which weighs several tons. Each ingot after it has solidified is then rolled in a blooming or slabbing mill to a body having a smaller cross section but considerably greater length than the original ingot. This rolled body is conventionally cut into shorter lengths which can be conveniently accommodated in the reheating furnaces for the mills which further reduce the steel. These sheared lengths may be called blooms or slabs depending on their relative dimensions. These lengths will hereafter be referred to as slabs, but it will be understood that the apparatus of my invention is equally applicable to blooms.

It is desirable that each slab carry upon it a number or other mark identifying the heat of steel from which it was made. It may be desirable that each slab carry a mark identifying the ingot from which it was rolled. It is generally desirable that each slab carry some mark indicating the portion of the ingot from which it was rolled, since the chemical composition of the top section of an ingot of steel differs from that of the bottom section because of segregation of constituents occurring during the cooling and solidification of the molten steel in an ingot mold. Since steel ingots are rolled at temperatures in the neighborhood of 2000° F., the marking of such hot bodies is difficult. It is difficult to find a medium which will be effective at this temperature, and it is difficult to apply such a medium to a hot body. It has been found that the most reliable means of identifying a hot body is to stamp an identifying character into the surface of the body with a steel stamp. Since a mark penetrating the surface deeply enough to be an identifying mark may cause surface imperfections during later rolling, such marks as a practical matter must be applied to the end of a slab.

It is an object, therefore, of my invention to provide apparatus for automatically stamping the ends of successive slabs with identifying characters. It is another object of my invention to provide such apparatus which may be installed at the location where slabs are sheared. It is another object to provide such apparatus which may be readily attached to existing apparatus in slab rolling mills without rebuilding or rearranging of such existing apparatus. Other objects of my invention will appear in the course of the following description of a present preferred embodiment thereof.

In the attached figures to which reference is now made: Figure 1 represents a side elevation of a present pre-

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ferred embodiment of the apparatus of my invention affixed to existing slabbing or blooming mill apparatus.

Figure 2 is an end elevation of my apparatus on the plane II—II of Figure 1.

Figure 3 is a plan of my apparatus on the plane III—III of Figure 2.

Figure 4 is another end elevation of my apparatus in a different position from that shown in Figure 2.

Figure 5 is a view of the apparatus shown in Figure 2 taken on the inclined plane V—V of Figure 2.

Figure 6 is an exploded view of certain portions of my apparatus forming a mounting therefor.

Figure 7 is a front view of one of the elements of Figure 6.

Figure 8 is a perspective view of a detail shown in Figures 5 and 7.

Figure 9 is a plan view of a portion of my apparatus.

Figure 10 is an end elevation of the apparatus of Figure 9.

Figure 11 is a detail, in perspective, of a portion of my apparatus showing the mounting means for a stamp holder.

Figure 12 is a detail, in perspective, of a rotary stamp holder carried by my apparatus.

Figure 13 is a horizontal cross section of the rotary stamp holder taken on the plane XIII—XIII of Figure 10.

Figure 14 is a perspective of another portion of the rotary stamp holder of Figure 9.

Figure 15 is a cross section through the rotary stamp holder on the plane XV—XV of Figure 9.

In the figures a conventional slab shear 2 is shown in outline, as the shear itself forms no part of my invention. This shear 2 is provided with a runout table 3 at its delivery end which comprises a series of rotatable horizontally mounted rolls 5—5. Each side of runout table 3 is provided with an upright side guard member 6. Adjoining slab shear 2 is an adjustable length gauge designated generally as 7, which is also shown largely in outline as it is also conventional and forms no part of my invention. This length gauge 7 includes a carriage 8 which moves along a horizontal track 9 positioned above runout table 3 and parallel to the long axis of this runout table. One end of track 9 is supported by the housing of slab shear 2 and the other end by a structural element 10 which straddles runout table 3. A screw 12 extends horizontally adjacent track 9 and is rotated by motor 13 and appropriate gearing not shown. A nut 15 which engages screw 12 is affixed to carriage 8 so that carriage 8 may be moved back and forth along track 9 by rotation of screw 12. Carriage 8 carries a gauge member 14 having a plane vertical end face 16. Member 14 can be raised and lowered vertically on carriage 8 by means of a rack 18 and pinion 19. In its lowermost position element 14 rests on runout table 3 and its end face 16 forms a stop against which a slab 20 may be run before being sheared. Pinion 19 is rotated by square shaft 22 upon which it is slideably mounted. Square shaft 22 is rotated by means not shown.

Upon the side of carriage 8 is bolted or welded a base plate 24 which is formed with a pair of undercut vertical slots 25—25 in its front face. A plate 27 is provided on its back surface with a pair of projecting keys 29—29 which fit into slots 25—25 and hold plate 27 in place on plate 24. Plate 27 may be readily attached to or detached from base plate 24 by vertical movement. Plate 27 is provided at its upper front edge with a plurality of aligned spaced tubular elements 30—30 which form one portion of a hinge. The other portion of this hinge is formed by aligned spaced tubular elements 31—31 attached to the top edge of a plate 33. Pin 34 passes through tubular elements 30—30 and 31—31 and permits plate 33 to be moved with respect to plate 27 about pin 34. Plate 27 is

provided with upstanding lugs 36—36 provided with openings 37—37. Plate 33 is provided with elongated openings 38—38 positioned to fit over lugs 36—36 when plate 33 is positioned against plate 27. Pins 39—39 may be inserted through holes 37—37 to lock plate 33 against plate 27.

Affixed to plate 33 and inclined downwardly and outwardly from the top thereof is plate 40 which is braced by vertical braces 41—41 and horizontal bracing member 42. The angle between plates 40 and 33 is about 30°. To the lower end of plate 40 is attached a heavy mounting plate 43 extending inwardly at right angles thereto. Plate 40 is also provided with a slightly elongated opening 44 approximately in its center. On the underside of plate 40 aligned bearing blocks 45—45 are positioned on either side of opening 44 and in these bearings is pivotally mounted an air cylinder 47. Air cylinder 47 is provided with a piston, not shown, and piston rod 48, the lower end of which through clevis 49 is pivotally connected to lug 51 affixed to plate 27. Air cylinder 47 is of the double acting type and is provided at either end with means connecting it to a source of air under pressure which are not shown.

Pivotally mounted on mounting plate 43 are a pair of parallel arms of equal length 53 and 54. Arm 53 is pivoted at one end thereof about pivot 55 on mounting plate 43, and arm 54 is pivoted at one end thereof about pivot 56 on mounting plate 43. Pivot 55 is closer to runout table 3 than is pivot 56. A line through and normal to the axes of pivots 55 and 56 makes an angle of about 45° with plate 40. Arm 53 is held in place on pivot 55 by nut 57, and arm 54 is held in place on pivot 56 by nut 58. Pivot 56 extends through mounting plate 43 and is freely rotatable in mounting plate 43. The upper end of pivot 56 is connected to crank arm 60 and held firmly in connection therewith by nut 61. At one corner of mounting plate 33 a bracket 62 is provided with a projecting lug 63 which is pivotally connected to a clevis 64 rigidly attached to an air cylinder 66. The piston rod 67 of air cylinder 66 terminates in a clevis 68 which is pivotally connected to the end of crank arm 60. Air cylinder 66 is likewise a double acting air cylinder and is provided at either end with connections to a source of air under pressure, not shown.

The opposite ends of parallel arms 53 and 54 are pivotally connected to a stamper head designated generally as 70. Stamper head 70 is provided with a bifurcated shank end 71—71 which is inclined thereto at an angle of about 30°. Thus the angle between stamper head 70 and parallel arms 53 and 54 is complementary to the angle between mounting plate 43 and plate 33. Arm 54 is pivotally connected to bifurcations 71—71 by pivot 73. Pivot 73 is held in place by a key 72 fitting a mating keyway in pivot 73 and fastened to shank 71 by screws 76—76. Arm 53 is pivotally connected to shank 71 by pivot 74, which is keyed to arm 53 by key 75 and pivots freely in bifurcations 71—71. The end of pivot 74 projecting above shank 71 is formed into a cam-shaped projection 77, which is elongated at right angles to the long axis of arm 53. As has been mentioned, arms 53 and 54 are parallel to each other and of the same length. For this reason pivot 74 is nearer to the junction of stamper head 70 and bifurcations 71—71 than is pivot 73.

Stamper head 70 has a stamping face 80 which is perpendicular and projects forward slightly from its body. Vertical face 80 and the front face 81 of the body of stamper head 70 are connected by a short vertical face 82 perpendicular to both of them. In the projecting corner formed by the intersections of faces 80 and 82 is machined an arcuate groove or channel designated generally 83 having a back wall 84 which is a portion of a cylinder, a plane upper face 85, a plane lower face 86 parallel thereto, and a front wall 87, which is also a portion of a cylinder and is uniformly spaced from back wall 84.

Front wall 87 is not continuous but extends downward from face 85 a short distance and upward from face 86 a short distance only, leaving a gap or open space 88. A die holder block 90 is formed with an arcuate flange 91 dimensioned to fit within arcuate channel 83, a forwardly projecting portion 93 which projects outwardly through opening 88 when flange 91 is within channel 83 and an upward projection 95 on forward projection 93. A recess 96 in the face of forwardly projecting portion 93 accommodates stamping dies 97—97. These dies are made with a semi-cylindrical transverse groove 98 in their bottom faces, and the bottom face of recess 96 is also provided with a mating semi-cylindrical transverse groove 99 which continues through the side walls of recess 96 as a hole 100. The dies 97 may therefore be locked in die holder block 90 by inserting pin 102 into hole 100 and through the cylindrical opening formed by channel 99 in die holder block 90 and groove 98 in each stamping die 97.

The die holder block 90 is held in stamper head 70 by the engagement of flange 91 and arcuate channel 83. Flange 91 is dimensioned to fit slideably in channel 83 so that die holder block 90 can slide in channel 83 so as to tilt the plane of the faces of stamping dies 97 with respect to front face 80 of stamper head 70. Thus, die holder 90 is self-aligning with respect to the ends of slabs it is required to stamp. Upon the upper face of stamper head 70 in line with upward projection 95 of die holder block 90 is an upright projection 101. Pivotally mounted on projection 101 by means of bolt 103 and nut 104 are a pair of arms 106 and 107, one on each side of projection 101. These arms 106 and 107 extend beyond the front face 80 of stamper head 70 and are formed to engage opposite side faces of upward projection 95 of die holder block 90. These arms are made of spring steel so that they yieldably restrain motion of die holder block 90 in arcuate groove 83. Spring arms 106 and 107 urge die holder block 90 toward a position in which its front face is parallel with front face 80 of stamper head 70.

The outer end of stamper head 70 is split or bifurcated into a pair of parallel elements 109—109. In the space between these elements 109—109 is rotatably mounted a rotary die holder designated generally as 110. Rotary die holder 110 is made of two separable portions split on a plane perpendicular to its axis of rotation. The larger portion 112 of this die holder is a disk including a hub element 113 which has the form of a regular prism. This prismatic hub has as many faces as stamping dies 114 which it is desired to include in rotary stamping head 110. In the embodiment shown hub 113 is octagonal in cross section, and stamper head 110 is provided with eight stamping dies 114. Portion 112 of die holder 110 is provided with eight channels 115—115, each extending outwardly at right angles from a face of hub 113 to the circumference of die holder 110. Each channel 115 is positioned to abut a face of hub 113 near an edge thereof, and channels 115—115 are regularly spaced about the circumference of die holder 110. Each channel 115 is dimensioned to permit a stamping die 114 to fit slideably therein. Portion 112 of rotary die holder 110 is provided on its inner face with an annular channel 117 through the segments of portion 112 between channels 115—115. Each stamping die 114 is likewise provided on its bottom face with a transverse groove 119, the outer edge of which is aligned with the outer edge of annular channel 117. The transverse channel 119 in each die 114 is cut as a portion of an annular channel concentric with the center of hub 113. Rotary die holder 110 is completed by disk-shaped portion 121 which mates with portion 112 and is formed with an upstanding annular key 122, which fits within annular channel 117 and channel elements 119, of each die 114 to lock dies 114 in place in rotary die holder 110. Annular key 122 of die holder portion 121 is not continuous but is formed with a gap 123 in its

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circumference of a width equal to or slightly greater than the width of a channel 115. Hub 113 is provided with a central bore 125 and keyway 126, and die portion 121 is likewise provided with a mating bore 127 and keyway 128. The die holder 110 is assembled on shaft 130 and locked together by key 131. The gap 123 in annular key 122 of die holder portion 121 is positioned so that it falls between a pair of dies 114 when rotary die holder 110 is locked together. This gap 123, however, permits a single die 114 to be withdrawn from die holder 110 and replaced without disassembling the entire rotary die holder. This is accomplished by moving shaft 130 upwardly a distance sufficient for key 131 to clear the upper edge of keyway 126 in die holder portion 121. Element 121 can then be rotated about shaft 130 until gap 123 in keyway 122 is aligned with channel 115 containing a die 114 which it is desired to remove.

The upper end of shaft 130 terminates in a ratchet wheel 132. The upper face of rotary die holder 110 carries a number of sawtooth-profiled grooves 133—133 disposed at regular intervals about its circumference, each groove 133 having a vertical edge 135 and an inclined edge 136. A clevis 138 is affixed to the upper surface of stamper head 70 near front face 80 and within this clevis 138 is pivotally mounted a dog 139 which projects downwardly over front face 80 of stamper head 70 so as to engage the grooves 133—133 formed in the upper face of rotary die holder 110. A flat spring member 140 is affixed to front face 80 of stamper head 70 so as to restrain yieldably upward motion of dog 139 about its pivotal mounting in clevis 138. This dog 139 and the grooves 133—133 previously mentioned form a detent which permits rotary stamping head 110 to rotate on shaft 130 in one direction only. Rotation of rotary die holder 110 in the direction which causes inclined face 136 of a groove 133 to lift dog 139 against the restraining force of spring member 140 may be effected, but rotation in the other direction brings vertical face 135 of a groove 133 against the outer face of dog 139, pushing it squarely against front face 80 of stamper head 70. The detent mechanism formed by dog 139 and grooves 133—133 is also used to position successive stamping dies 114 carried by rotary die holder 110 in the proper stamping position. This is accomplished by proper location of grooves 133—133 with respect to the dies 114—114.

Ratchet wheel 132 has as many teeth as there are dies 114—114 in rotary die holder 110. In the embodiment shown ratchet wheel 132 has eight teeth, each with a perpendicular face 142 and an inclined face 143. Ratchet wheel 132 is mounted with respect to rotary die holder 110 so that if force is exerted against a vertical face 142 of a tooth, die holder 110 will be rotated in the direction permitted by its detent mechanism. It was previously mentioned that channels 115—115 in rotary die holder 110 abutted the plane faces of hub 113 near the outer edge of each such face. These channels 115 are so positioned that a force exerted against a stamping face of a stamping die 114 tends to rotate rotary die holder 110 in the direction prevented by the detent mechanism comprising dog 139 and grooves 133—133 previously described.

A guide member 145 is affixed to stamper head 70 so as to project above the surface thereof near ratchet wheel 132. This guide member 145 is formed to permit sliding motion in its axial direction of elongated member 146. The outer end of member 146 is formed into a hook-like projection 147 which is adapted to engage a vertical face 142 of ratchet wheel 132. Flat spring member 149 attached to guide member 145 urges projection 147 toward ratchet 132. The inner end of element 146 is joined by threaded rod 144 to a clevis 150 which is pivotally connected to a lever arm 151 at a point near one end thereof. Lever arm 151 is pivotally mounted by means of bolt 152 intermediate its ends upon stamper head 70 so that its free end 154 is adjacent to cam-shaped

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projection 77 previously mentioned. Since cam-shaped projection 77 is inclined to the plane of stamper head 70, the free end 154 of lever arm 151 is bevelled to engage a side face of projection 77. Guide member 145 previously mentioned is provided with a bracket 156, and a tension spring 157 is connected between this bracket and a pin 158 in the end of lever arm 151 adjacent clevis 150 so as to urge free end 154 of lever arm 151 toward cam-shaped projection 77. Threaded rod 144 previously mentioned has right hand threads at one end and left hand threads at the other. Elements 146 and 150 are likewise tapped with right and left hand threads, respectively, so that the distance between elements 146 and 150 may be adjusted by turning threaded rod 144. Rod 144 may then be locked by turning jam nut 153 tight against clevis 150.

The operation of the apparatus of my invention will be set out in connection with the present preferred embodiment thereof which is illustrated in the attached figures and has been described in the foregoing paragraphs. As I have mentioned, I prefer to install my apparatus at the slab shear since this is a convenient place for stamping the ends of the sheared slabs. I also prefer to affix my apparatus to existing structures conventionally forming a part of a slab shear. When a steel ingot has been rolled into a body of reduced cross section and increased length which is to be sheared into slabs, the rolled body is passed through the opened shear a distance equal to the length of the first slab to be sheared off. A length gauge of some description must be used to facilitate the positioning of the rolled body for shearing to the proper length, and, as I have indicated, a slab shear is conventionally provided with such a gauge which can be moved along a track mounted above the shear runout table. This horizontal track 9 is conventionally marked off in units of length. A carriage 8 moves along this track as has been mentioned and is provided with a movable gauge member 14, the vertical end face 16 of which acts as a stop against which the rolled body 20 may be advanced. In Figure 1 of the drawings, this member 14 is shown as raised above the runout table to permit operation of my stamping apparatus and transfer of the sheared slab 20 along runout table 3. It will be understood that this member 14 is lowered to the table level to position slab 20 for shearing. After the slab 20 has been sheared in the conventional way and gauge member 16 has been raised in the position shown in Figure 1, the operation of my apparatus commences.

It will be seen that my apparatus, mounted on carriage 8 which is a part of length gauge 7 conventionally used with a slab shear, is automatically properly positioned for stamping slabs sheared to any length determined by the setting of length gauge 7.

It will be assumed that plate 33 of my apparatus is locked against plate 27 as is shown in Figures 1 and 2. It will also be assumed that parallel arms 53 and 54 are drawn upwardly and outwardly in the position shown in broken lines in Figure 3. With the apparatus of my invention in this position, air is admitted to the clevis end of air cylinder 66, causing piston rod 67 to move outwardly and turn crank 60 about pivot 56. This causes parallel arm 54 to swing downwardly and inwardly in a plane inclined to a vertical plane through the longitudinal axis of runout table 3. Parallel arm 53, of course, also swings downwardly, and the two move stamper head 70 so that it is brought in and down against the end of slab 20. The parallel linkage provided by arms 53 and 54 maintains the stamping head 70 in the same angular position with respect to slab 20 throughout the above-described movement; in other words, the movement of these parallel arms imparts motion of translation only to stamper head 70. After the stamper head has been brought into contact with slab 20, impressing dies 97—97 and 114 upon the end face of slab 20, air is admitted to the other end of air cylinder 66 which causes arms 53

and 54 to swing upwardly and outwardly again back into the position shown in broken lines in Figure 3. The stamper head 70 of my apparatus is thus swung from a position above and outside the runout table 3 over side guard member 6 and against slab 20 on runout table 3, and back again into its original position where it does not interfere with further use of runout table 3.

Stamper head 70 has been described as provided with two stamping die holders. Die holder 90 is adapted to hold a number of individual stamping dies which may carry the heat number of the heat of steel from which the slabs were made. This heat number or other designation must be changed manually when an ingot from a different heat is rolled and sheared. When the apparatus of my invention is in the position shown in broken lines in Figure 3, this change can be readily made as the stamper head 70 is clear of runout table 3. As has been mentioned, die holder 90 fits into an arcuate channel in stamper head 70 and is so mounted that it may slide in this channel sufficiently to align the faces of stamping dies 97—97 with the end face of slab 20 if the latter is not square, as is frequently the case. When stamping dies 97—97 are out of contact with slab 20, however, spring arms 106 and 107 restore stamping die holder 90 to its original position in which the faces of stamping dies 97—97 are parallel to the front face 80 of stamper head 70.

Stamper head 70 also carries rotary die holder 110. The dies 114—114 carried by die holder 110 may bear numbers one through eight, or other characters which designate the successive slabs sheared from a single ingot. The die 114 in stamping position must therefore be changed each time a slab is stamped by my apparatus, so that the next stamping die 114 in order is in proper position. This change is accomplished by rotating rotary die holder 110, and my apparatus is constructed so as to rotate rotary die holder 110 automatically in amount sufficient to bring the next adjoining stamping die 114 into stamping position each time stamper head 70 is swung down and back again from its retracted position. It can be seen from Figure 2 that when my apparatus is in stamping position cam-shaped projection 77, which is rigidly attached to parallel arm 53, does not make contact with lever arm 151. When stamper head 70 is swung to its retracted position, however, it may be seen from Figures 9 and 10 that the outer end face of cam-shaped projection 77 bears against the bevelled end 154 of lever arm 151. This causes lever arm 151 to move in a counterclockwise direction about pivot 152, pulling arm 146 so that projection 147 engages vertical face 142 of one tooth of ratchet 132, and as arm 146 is moved longitudinally, ratchet 132 is turned in a counterclockwise direction until projection 147 slips off the tooth with which it was engaged. The detent mechanism comprising dog 139 and the various grooves 133—133 permits rotary stamping head 110 to move in this direction, and positions it after such movement so that the next adjoining stamping die 114 is in stamping position. Thus, each time stamper head 70 is swung downwardly and back again rotary die holder 110 is turned up one position. If the number of slabs sheared from an ingot is less than the full number of dies carried by rotary head 110, the initial die can be brought into position for the first slab in the next ingot by swinging stamper head 70 downward and back again the proper number of times before the next slab 20 is in stamping position.

The apparatus of my invention may easily be swung entirely clear of carriage 8 for maintenance purposes. To do this keys 39—39 are knocked out of lugs 36—36. Air is then admitted to the outer end of air cylinder 47 which causes plate 33 and all the apparatus attached thereto to swing outwardly and upwardly about pin 34 to the position shown in Figure 4.

I claim:

1. Apparatus for stamping identifying characters on

a slab comprising a runout table adapted to receive a slab, a mounting plate positioned above said runout table, said mounting plate being inclined at an angle to a vertical plane through the long axis of said runout table, a pair of parallel arms of equal length each pivotally mounted at an end thereof on said mounting plate, said pivots being unequally spaced from said runout table, a stamper head having a shank portion inclined thereto at an angle, said angle being complementary to said angle of inclination of said mounting plate, said shank portion being pivotally connected to each of said parallel arms at the opposite end thereof, stamping die means affixed to the face of said stamper head, and means for moving one of said parallel arms about its pivot on said mounting plate whereby the stamper head is swung without rotation from a position above the runout table inwardly and downwardly against the end of a slab upon the runout table.

2. Apparatus for stamping identifying characters on a slab comprising a runout table adapted to receive a slab, a horizontal track positioned above the runout table and extending parallel to the long axis thereof, a carriage movable along said track, a mounting plate affixed to said carriage and inclined outwardly and upwardly with respect thereto at an angle to the vertical, a pair of parallel arms of equal length each pivotally mounted at an end thereof on said mounting plate, a stamper head pivotally connected to each of said parallel arms at the opposite end thereof, stamping die means affixed to the face of said stamper head, and means for moving one of said parallel arms about its pivotal mounting on said mounting plate whereby the stamper head is swung without rotation from a position above the runout table inwardly and downwardly against the end of a slab upon the runout table.

3. Apparatus of claim 2 in which the mounting plate is affixed to an upright member which is pivotally mounted on the carriage about a pivot parallel to the long axis of the runout table and including means for swinging said upright member about said pivot whereby said stamper head can be withdrawn to one side of said runout table and said stamping die means made readily accessible.

4. Apparatus of claim 2 in which said stamping die means are disposed about the periphery of a rotatable die holder, and including means operated by movement of said parallel arms to rotate said rotatable die holder.

5. Apparatus for stamping identifying characters on a slab comprising a mounting plate, a pair of parallel arms of equal length, each pivotally mounted at an end thereof on said mounting plate, a stamper head pivotally connected to each of said parallel arms at the opposite end thereof, a cam-shaped projection affixed to one parallel arm, a rotatable die holder mounted on the stamper head and provided with a plurality of stamping dies disposed about its periphery, detent means adapted to hold said die holder in each of a plurality of positions presenting a stamping die in stamping position, a ratchet wheel fixed to said rotatable die holder, tripping means moveably mounted on said stamper head engaging a tooth of said ratchet wheel and bearing against said cam-shaped projection, means urging said tripping means against said cam-shaped projection, and means for moving one of said parallel arms about its pivotal mounting on said mounting plate, whereby said movement causes said cam-shaped projection to move said tripping means and bring about rotation of said rotatable die holder sufficient to advance into stamping position the next adjoining die.

6. Apparatus of claim 5 in which the tripping means comprise an arm mounted on said stamper head for longitudinal movement, one end of said arm being provided with a projection engaging a tooth of said ratchet wheel, and the other end of said arm being pivotally attached to an end of a lever arm pivotally mounted at a point

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intermediate its ends on said stamper head, the other end of said lever arm bearing against said cam-shaped projection.

7. Apparatus for stamping identifying characters on a slab comprising elongated means for supporting a slab so that an end face thereof is substantially perpendicular to the long axis of said elongated means, a mounting plate positioned above said elongated means and inclined downwardly toward a vertical plane through the long axis of said elongated means, a pair of parallel arms of equal length each pivotally mounted at an end thereof on said mounting plate in a plane parallel thereto, a stamper head pivotally connected to each of said parallel arms at the opposite end thereof, stamping die means affixed to the face of said stamper head, and means for moving one of said parallel arms about its pivot on said mounting plate whereby translational motion only is imparted to said stamper head when it is swung against an end face of a slab.

8. Apparatus of claim 7 in which the face of the stamper head is provided with an arcuate channel and the stamping die means are affixed to a die holder block having a projecting portion fitting within said arcuate channel whereby said die holder block may slide in said arcuate channel so as to tilt the face of the stamping die means relative to the face of the stamper head.

9. Apparatus of claim 7 in which the face of the

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stamper head is provided with an arcuate channel, the stamper die means are affixed to the die holder block having a projecting portion fitting within said arcuate channel whereby said die holder block may slide in said arcuate channel so as to tilt the face of the stamping die means relative to the face of the stamper head, and yieldable restraining means urging said die holder block into a position in which the face of the stamping die means is parallel to the face of the stamper head.

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