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J. R. GEORGE.
SHEARING MECHANISM FOR CUTTING INGOTS.

APPLICATION FILED JULY 3, 1903.

NO MODEL.

Fig. 1.

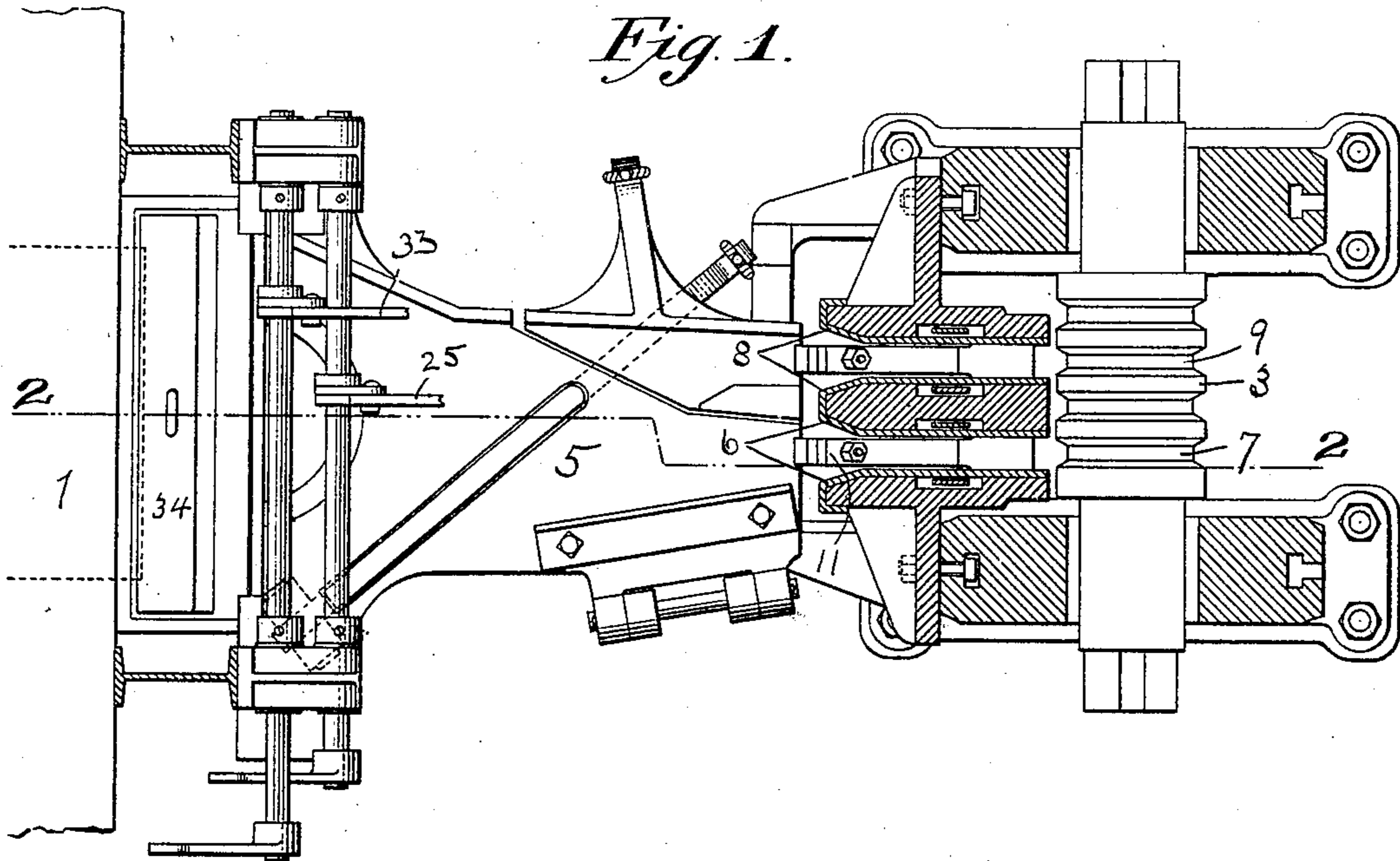
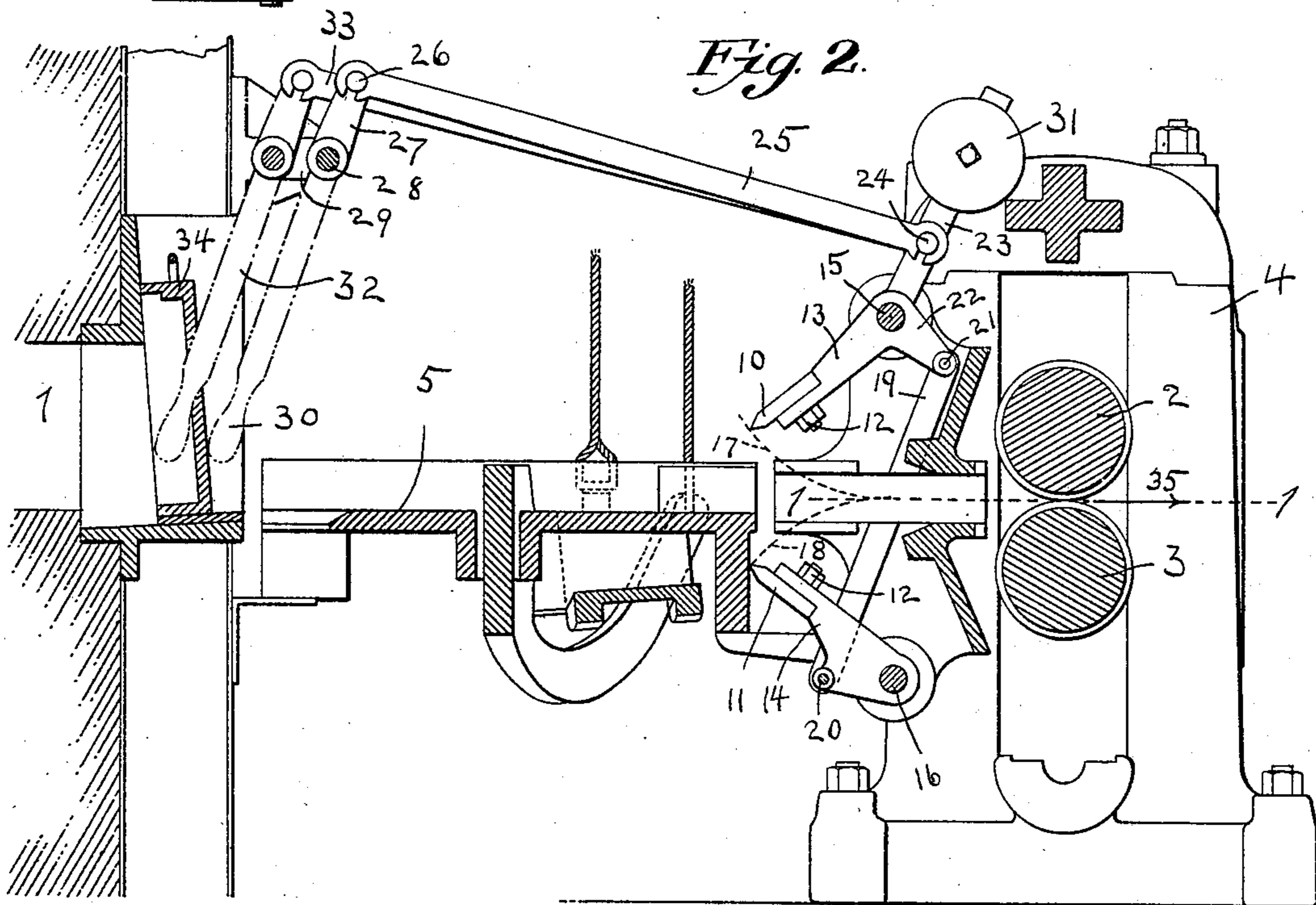


Fig. 2.



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SHEARING MECHANISM FOR CUTTING INGOTS.

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Application filed July 3, 1903. Serial No. 164,133. (No model.)

To all whom it may concern:

Be it known that I, JEROME R. GEORGE, a citizen of the United States, residing at Worcester, in the county of Worcester and Commonwealth of Massachusetts, have invented a new and useful Improvement in Shearing Mechanism for Cutting Ingots, of which the following is a specification accompanied by drawings forming a part of the same, in which—

Figure 1 represents a plan view of a shearing mechanism embodying my invention, that portion comprising the roll-housing being shown in horizontal sectional view on line 1 1, Fig. 2; and Fig. 2 is a side view represented in section on line 2 2, Fig. 1.

Similar reference-figures refer to similar parts in the different views.

My present invention relates to a shearing mechanism adapted to be used in cutting off imperfect or "crop" ends of ingots as they are removed from a heating-furnace and presented to the first pair of rolls in a rolling-mill without interrupting the movement of the ingot during the operation of shearing; and it consists in the employment of a pair of opposing vibrating shear-blades arranged to simultaneously engage an ingot on opposite sides and be forced through the ingot as the ingot is moved longitudinally by its engagement with the rolls of the rolling-mill.

Referring to the accompanying drawings, 1 denotes an ingot-heating furnace, and 2 3 the upper and lower rolls of a rolling-mill journaled in a housing 4. The ingots as they are heated in the furnace 1 are moved across a conveyer-platform 5 by the attendants through suitable guides to the circumferential grooves or passes of the rolls. In the present instance two separate guideways or passages are provided, the first, formed by the guide-plates 6, leading to one of the passes in the rolls, or that formed, in part, by the groove 7 in the lower roll 3, the other guideway or passage, formed by the plates 8, leading to the pass formed, in part, by the groove 9 in the lower

roll 3. The number of guides employed, however, may be varied as desired, according as the rolls have one or more operative passes. I provide a shearing mechanism for each guide and operative pass in the rolls to enable the crop end of an ingot to be cut off as the ingot is being moved through either of the passes of the rolls. The mechanism shown in the accompanying drawings therefore embodies two shearing mechanisms which are duplicates of each other and capable of independent action.

The shearing mechanism consists of an upper and lower shear-blade 10 and 11, attached by bolts and nuts 12 to an upper vibrating lever 13 and a lower vibrating lever 14, which are pivoted in the same vertical plane at 15 and 16 at equal distances above and below a horizontal plane lying midway between the axes of the rolls 2 and 3, and the cutting edges of the shear-blades 10 and 11 when simultaneously swung into a vertical plane on the broken lines 17 18 are arranged to just pass each other in a vertical plane and midway between their axes of vibration. The two swinging levers 13 and 14 are coupled together by a link 19, pivoted at 20 to the lower lever 14 and pivoted at 21 to a radial arm 22 on the lever 13. The lever 13 is provided with a third arm 23, provided with a stud 24, on which is pivoted one end of a link 25. The opposite end of the link 25 is pivoted on a stud 26, held in the lever 27, pivoted at 28 upon a fixed bracket 29, the opposite end of the lever 30 forming a handle by which the shear-blades 10 and 11 are swung on their axes to bring their cutting edges into engagement with the upper and under sides of an ingot as the latter is being swung between the rolls 2 and 3. As soon as the cutting edges of the shear-blades 10 and 11 are made to engage the ingot the swinging movement of the shear-blades will be continued toward the rolls by the movement of the ingot itself until the shear-blades are brought into a vertical plane between their axes of vibration,

when the complete severance of the ingot will have been accomplished, allowing the ingot to continue its movement between the rolls and away from the severed crop end.

5 The swinging movement of the shear-blades is then reversed by the attendant, facilitated by a counterweight 31, carried on the arm 23. Each pair of swinging levers 13 and 14 are pivoted in a vertical plane passing through
 10 the guideway or passage for the ingot formed by the guide-plates 6 and 8, which control the position of the ingot to insure its being properly engaged by the swinging shear-blades, as both the ingot and the shear-blades in en-
 15 gagement therewith during the period of cutting are held between the vertical walls of the guide-plates. A duplicate pair of shear-blades are arranged for the passage between the guide-plates 8 for the purpose of severing
 20 an ingot fed to the second operative pass in the rolls, and the second shear mechanism is similarly operated by the attendant through a lever-handle 32, pivotally connected with the shear-blades through a link 33.

25 The operation of my shearing mechanism is as follows: The vertical sliding door 34 of the furnace is opened and the heated ingot withdrawn from the furnace by the attendant onto the receiving-table or conveyer-platform
 30 5, on which it is moved endwise until its advancing end is engaged between the rolls 2 and 3, when the action of the rolls will continue the movement of the ingot in the direction of the arrow 35. The shear-blades 10 and
 35 11 are swung by the attendant into juxtaposition with the moving ingot until the section at which it is desired to sever the crop end passes between the opposing shear-blades, when the latter are pressed against the ingot
 40 and caused to engage the same sufficiently to be moved with the ingot toward the rolls and forced through the ingot.

I have described this invention as a shearing mechanism for cutting ingots and designed
 45 for removing the last end of an ingot as it passes through the rolls of a mill; but the arrangement of swinging shear-blades herein shown and described may be employed for a like purpose in connection with a billet or
 50 other metal bar which it is desired to sever as the advancing section is being drawn between the rolls of a mill without interrupting the movement of the metal bar.

What I claim as my invention, and desire to
 55 secure by Letters Patent, is—

1. In a shearing mechanism for cutting ingots, the combination of a pair of opposing non-intersecting vibrating shear-blades pivoted on opposite sides of the path of a moving
 60 ingot, with their pivots separated by a distance equal to twice the length of said blades, and arranged to engage simultaneously an ingot passing between them, and means for mov-

ing an ingot longitudinally between said shear-blades, whereby said blades are drawn into
 65 said ingot gradually to sever it.

2. The combination of a pair of pivoted levers capable of a swinging movement in circular non-intersecting arcs in a plane coincident with the path of a moving ingot and on
 70 opposite sides thereof, shear-blades carried by said levers and arranged to intersect the path of the ingot, and be drawn into said ingot by its longitudinal motion in order gradually to sever it and means for moving an ingot lon-
 75 gitudinally between said shear-blades.

3. The combination with a pair of swinging non-intersecting shear-blades pivoted on opposite sides of a moving ingot, with their pivots separated by a distance equal to twice the
 80 length of said shear-blades, means for rocking said blades on their pivots to engage an ingot as it is moved between them, and means for moving an ingot longitudinally between said shear-blades, whereby said blades are
 85 drawn into said ingot gradually to sever it.

4. The combination with a pair of swinging non-intersecting shear-blades pivoted on opposite sides of a moving ingot, with their pivots separated by a distance equal to twice the
 90 length of said shear-blades, means for simultaneously rocking said shear-blades, and means for moving an ingot longitudinally between said blades in a path intersecting the circular tangential arcs described by the cutting edges
 95 of said shear-blades.

5. In a shearing mechanism for cutting ingots, the combination of a pair of opposing non-intersecting vibrating shear-blades pivoted on opposite sides of the path of a moving
 100 ingot, with their pivots separated by a distance twice the length of said blades and arranged to engage simultaneously an ingot passing between them, means for moving an ingot longitudinally between said shear-blades,
 105 whereby said blades are drawn into said ingot gradually to sever it, and means for restoring said shear-blades to their original position ready to engage another portion of the ingot.

6. In a rolling-mill, the combination with a
 110 pair of swinging non-intersecting shear-blades pivoted one above and one below the pass of the rolls, with their pivots separated by a distance equal to twice the length of said shear-blades, a pair of rolls by means of which an
 115 ingot may be drawn between said blades, and means for bringing said shear-blades into engagement with the ingot as it is drawn between them, whereby said ingot is gradually severed by its own motion.
 120

7. The combination with a pair of rolls, of a pair of swinging non-intersecting shear-blades adapted to engage an ingot as it is moved between said rolls in a path intersecting the circular tangential arcs described by the cutting
 125 edges of said shear-blades, a pivoted hand-le-

ver, a link connecting said lever and one of
said shear-blades by which said shear-blade is
rocked and a link connecting said shear-blades.

8. The combination with a pair of rolls of a
5 rolling-mill, and means for supporting an in-
got as it is presented to said rolls, of a pair
of non-intersecting shear-blades capable of
swinging in circular tangential arcs in front
of one of the passes in said pair of rolls and

on opposite sides of the path of an ingot as it is
moved by said rolls between said shear-
blades.

Dated this 27th day of June, 1903.

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Witnesses:

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