March 9, 1926. 1,576,332

A. DE C. KESSLER

HYDRAULIC INGOT TRIMMING PRESS

Filed August 31, 1923 5 Sheets-Sheet 1

Fig. 1.

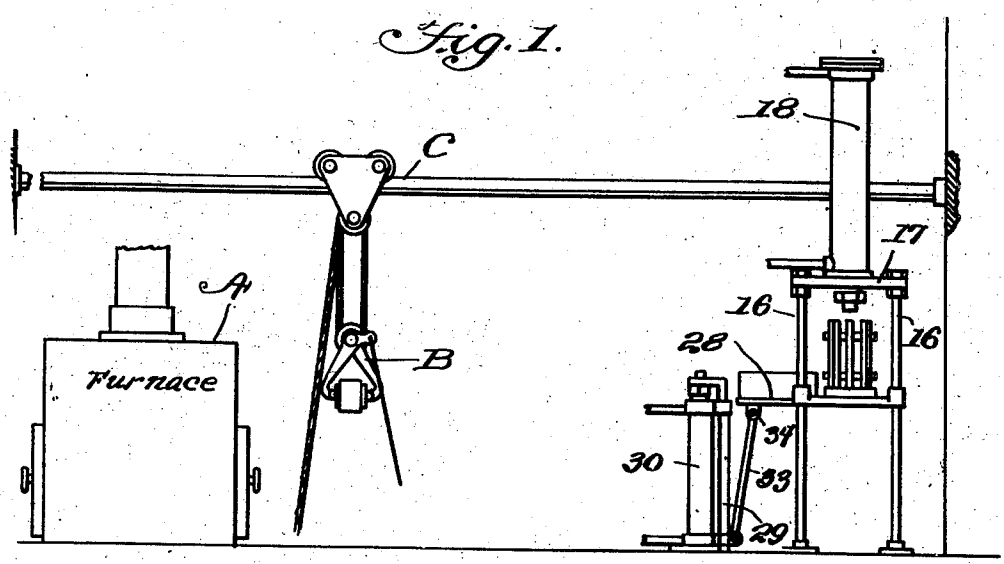


Fig. 11.

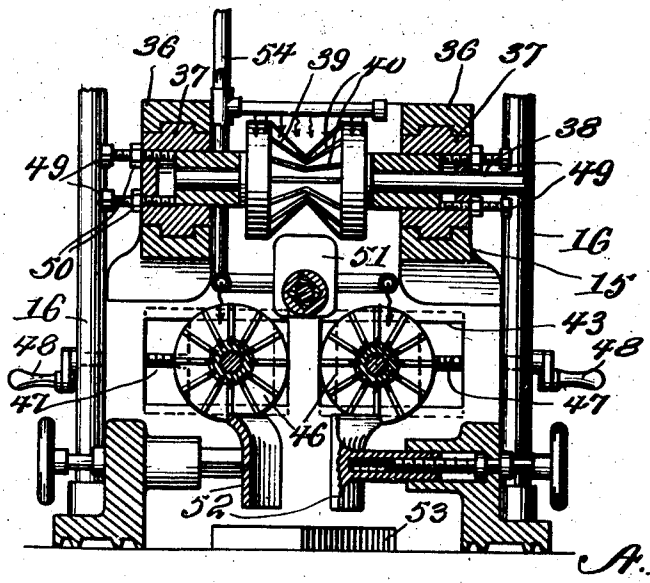


Fig. 15.

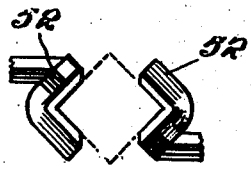
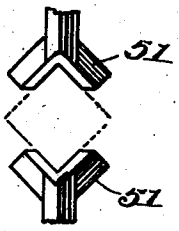


Fig. 14.



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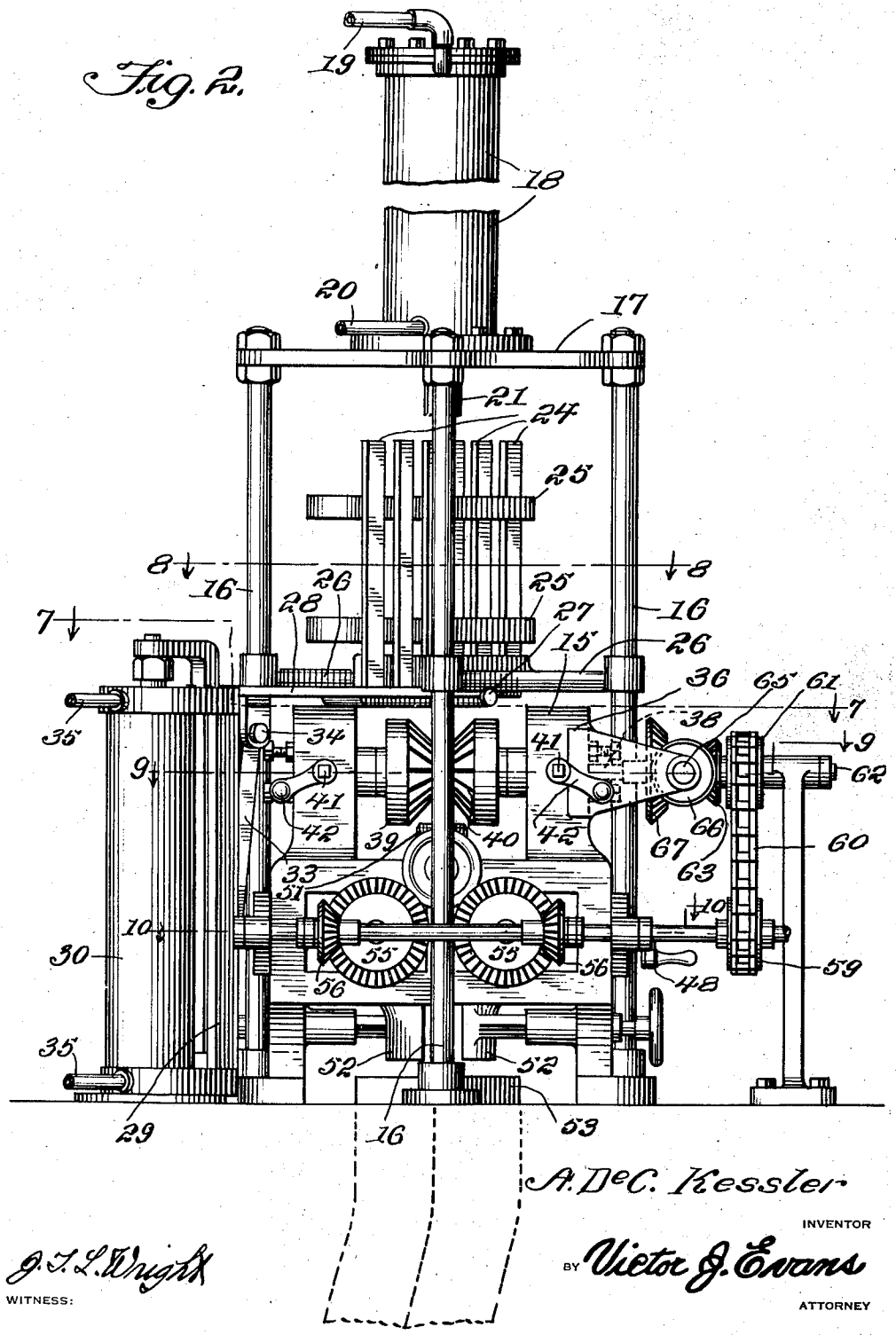
March 9, 1926. 1,576,332

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HYDRAULIC INGOT TRIMMING PRESS

Filed August 31, 1923 5 Sheets-Sheet 2

Fig. 2.



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HYDRAULIC INGOT TRIMMING PRESS

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Fig. 3.

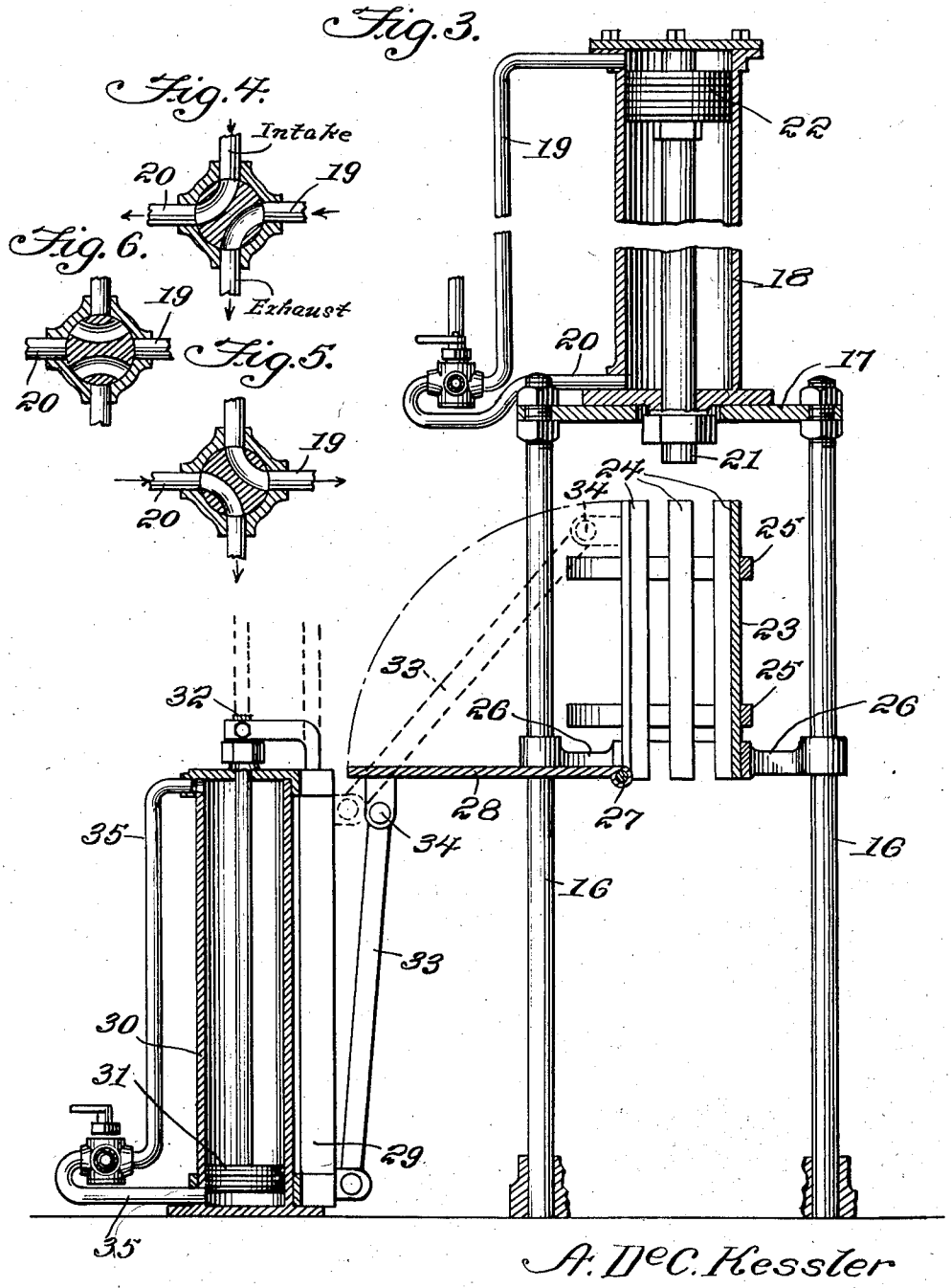


Fig. 4.

Fig. 6.

Fig. 5.

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HYDRAULIC INGOT TRIMMING PRESS

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Fig. 7.

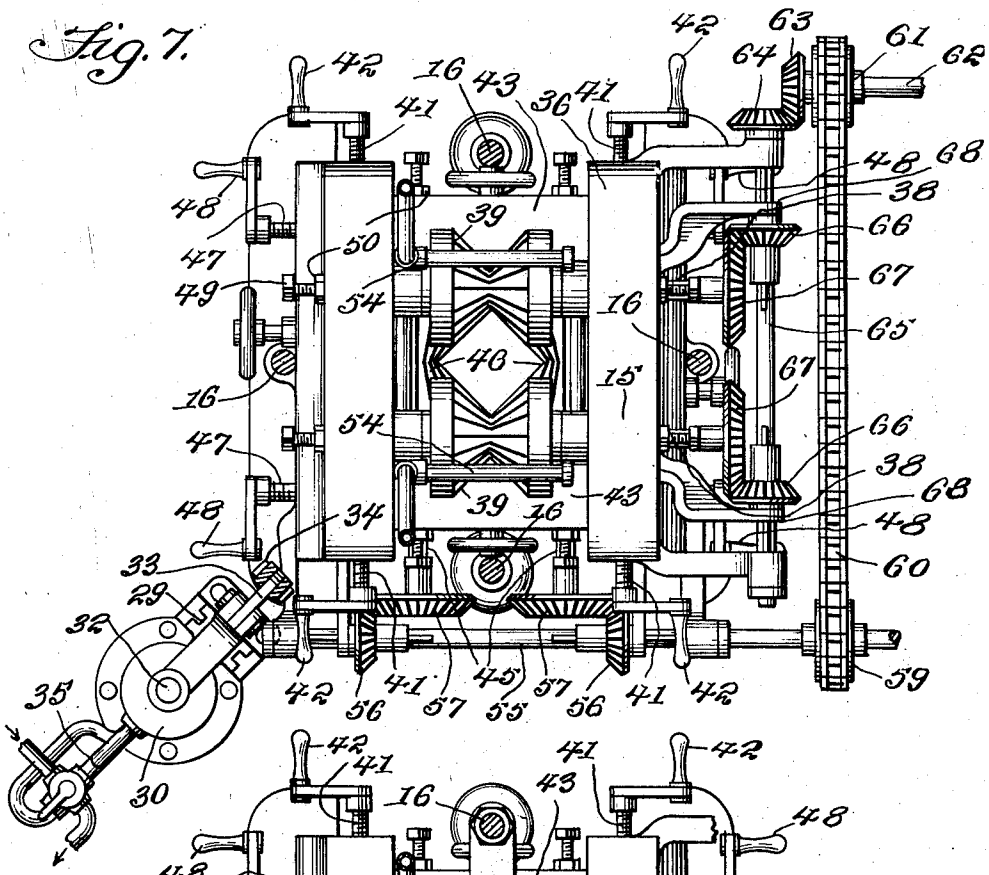
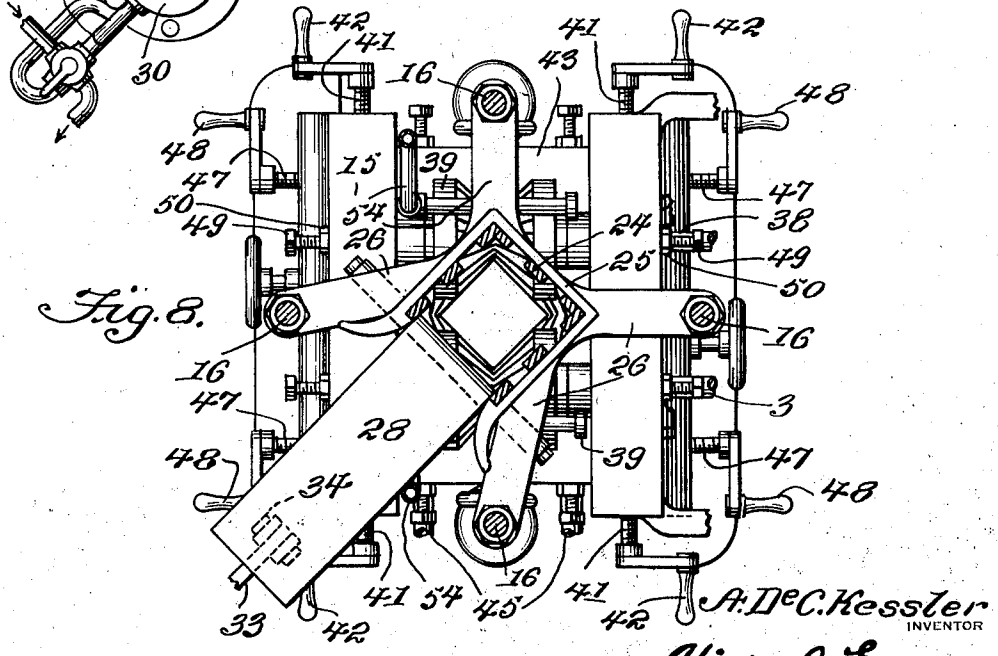


Fig. 8.



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HYDRAULIC INGOT TRIMMING PRESS

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Fig. 9.

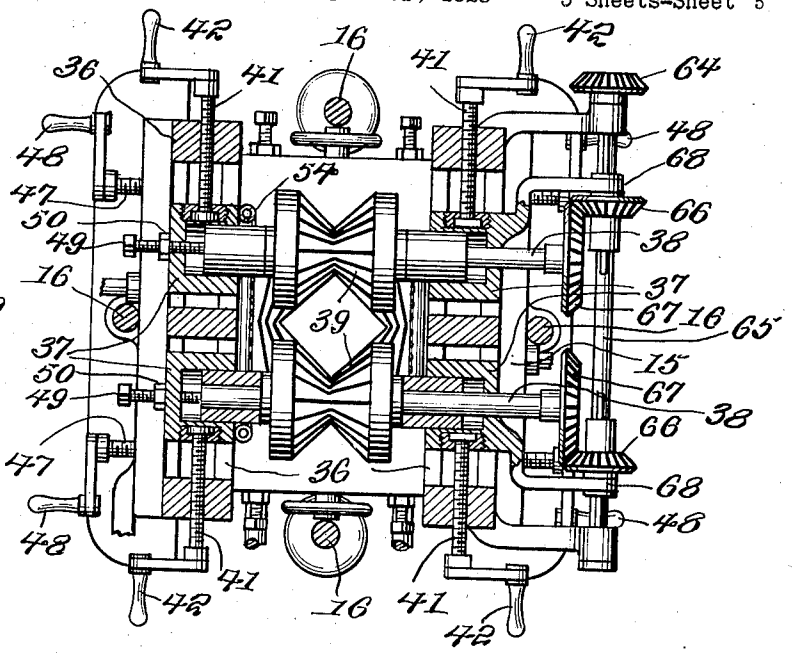


Fig. 10.

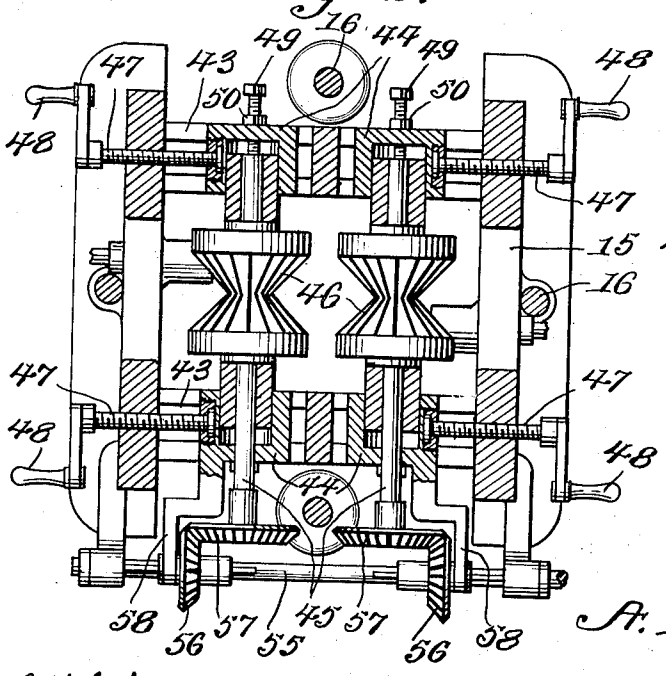


Fig. 12.

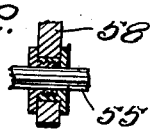
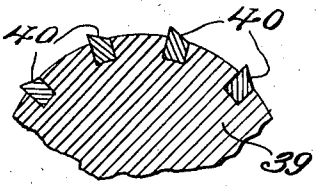


Fig. 13.



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UNITED STATES PATENT OFFICE.

ALPHONSO DE CLAUDE KESSLER, OF DUNKIRK, NEW YORK.

HYDRAULIC INGOT-TRIMMING PRESS.

Application filed August 31, 1923. Serial No. 660,410.

To all whom it may concern:

Be it known that I, ALPHONSO DE CLAUDE KESSLER, a citizen of the United States, residing at Dunkirk, in the county of Chautauqua and State of New York, have invented new and useful Improvements in Hydraulic Ingot-Trimming Presses, of which the following is a specification.

This invention relates to trimming machines and has for its object the provision of a novel device for trimming bars, ingots or billets of iron, steel and the like whereby to remove surface imperfections, flaws, roughnesses, seams and the like, so that the bar, ingot or billet will be in proper condition to be passed to the rolling machine for subsequent treatment.

An important and more specific object is the provision of a machine of this character in which use is made of a hydraulic press for forcing the hot billet or ingot through the set of trimming cutters, the cutters being positively rotated in opposition to the travel of the ingot and being power driven.

Another object is the provision of hydraulic press operated means for leading the ingot into the guide to the cutters.

Another object is the provision of a machine of this character which is provided with means for adjusting the cutters to vary the distance therebetween for treating billets of different sizes or for cutting billets to different depths depending upon different conditions.

An additional object is the provision of a machine of this character which will be simple and inexpensive to manufacture, easy to control and operate, positive in action, efficient and durable in service and a general improvement in the art.

With the above and other objects and advantages in view the invention consists in the details of construction to be hereinafter more fully described and claimed and illustrated in the accompanying drawings, in which:

Figure 1 is a somewhat diagrammatic side elevation of the device showing it associated with a furnace and a trolley,

Figure 2 is a side elevation of the device alone on a larger scale,

Figure 3 is a longitudinal section,

Figures 4, 5 and 6 are detail sections showing the valve positions,

Figure 7 is a horizontal section on the line 7—7 of Figure 2,

Figure 8 is a similar view on the line 8—8 of Figure 2,

Figure 9 is a section on the line 9—9 of Figure 2,

Figure 10 is a section on the line 10—10 of Figure 2,

Figure 11 is a detail vertical section,

Figure 12 is a detail section through a bracket and the shaft passing therethrough,

Figure 13 is a detail section through one of the cutters,

Figures 14 and 15 are detail views of the ingot guides.

Referring more particularly to the drawings the letter A designates, diagrammatically, a suitable furnace from which hot ingots are taken by means of tongs B carried by a trolley runway C which permits the ingot or billet to be brought to my machine. In carrying out my invention I provide an upright supporting frame 15 of any desired or preferred construction and this frame may be formed as a single casting or constructed of any suitable number of parts, bolted, riveted or otherwise secured together. Secured to and rising from the base portion of this frame are upright rods 16 upon the upper ends of which is secured a platform 17 on which is mounted a hydraulic cylinder 18. The inlet and outlet of liquid to this hydraulic cylinder is through pipes 19 and 20 and any suitable control means, not shown, is of course provided for permitting inlet of water into and outlet of water from this cylinder. The platform is necessarily provided with a hole through which passes the cylinder plunger rod 21 which is carried by a piston 22.

Located above the base frame 15 is a cage structure designated broadly by the numeral 23 which is formed from a plurality of slats 24 connected by upper and lower U-shaped members 25 which have their forward ends curved outwardly to define guides to the interior of the cage. This side of the cage structure is open as clearly disclosed. Any desired means might be provided for supporting this cage, but in actual practice I employ bracket arms 26 which are bolted or otherwise secured to the bottom of the cage and which are carried upon one or more of the uprights 16. This cage is in such position that it is immediately below the plunger rod 21. Hinged at 27 is a door 28 which is for the purpose of closing the cage and for the additional purpose of

serving as a guide chute for conducting bars or billets into the machine. The relative arrangement of the parts is such that when the door 28 is in its down swung position an ingot carried by the tongs B may be placed upon the door.

To tilt the door for the purpose of sliding the ingot into the cage, I provide a support 29 upon which is mounted a hydraulic cylinder 30 containing a piston 31 carried by a plunger rod 32 which is slidable along the support 29 and with which is pivotally connected a link 33 which is in turn pivoted at 34 on the door 28. The cylinder 30 is provided with pipes 35 which are necessarily valve controlled and which permit inlet and outlet of water into and from the cylinder for moving the plunger.

At opposite sides the upper portion of the frame 15 is formed with guides 36 within which are slidable pairs of bearings 37 within which are journaled shafts 38 carrying cutters 39. Each of these cutters is shown as being of double truncated cone shape or tapered inwardly from both ends towards the center for conforming engagement upon a corner of the bar or ingot to be trimmed. These cutters might vary in actual construction, though a convenient arrangement is to construct these cutters as rollers formed with longitudinal grooves within which are mounted cutting blades 40 which might be replaced when worn or excessively dull. The cutters 39 are designed to act upon two diagonally opposite corners of the billet for trimming off imperfections.

To regulate the distance between the cutters for working upon billets of different sizes and for making cuts of different depths on the sides of the billet, I provide screws 41 which are threaded through the frame, which project into the guides 36 and which have a swiveled connection with the bearings 37. At their outer ends these screws are equipped with handles 42 for effecting rotation thereof

At the lower portion of the frame the other two opposite sides are provided with guides 43 within which are slidably mounted pairs of bearings 44 within which are journaled shafts 45 carrying cutters 46 similar in construction to the cutters 39 but so positioned as to act upon the other two diagonally opposite corners of the ingot or billet. The cutters 46 are likewise adjustable by means of screws 47 threaded through the frame and swivelly connected with the bearings 44. The outer ends of the screws 47 carry handles 48 whereby rotation may be imparted to the screws for shifting the rollers.

Each bearing includes a relatively stationary section within which is mounted a relatively movable section and I provide set screws 49 equipped with lock nuts 50, for the purpose of making a micrometer adjustment on the bearings to insure alignment of the center lines of the cutters. Between the two pairs of cutters, I provide suitably mounted angular guides 51 and below the lowermost cutters, I provide other similar guides 52 which are however located at right angles with respect to the guides 51. In other words the guides 51 between the two pairs of cutters engage against opposite corners of the billet or ingot when the nose thereof passes by the first cutters and acts to guide the billet to the lower cutters. The guides 52 are for the purpose of conducting the trimmed billet into a suitable discharge chute 53 from which the ingots pass to the rolling machine in connection with which my device is used.

To prevent excessive overheating of the cutters while in service, I provide a set of pipes 54 which are located adjacent the cutters and which are connected with any suitable source of water supply. These pipes are perforated so that they will discharge small streams or jets of water onto the cutters for preventing them from heating to such an extent as to lose their temper. The specific arrangement of pipes is disclosed in the drawing but is not disclosed in detail for the reason that it may be varied to suit the requirements of the individual manufacturer.

In order to effect driving of the cutters, I provide a drive shaft 55 on which are splined bevel gears 56 which mesh constantly with bevel gears 57 on the ends of the cutter shafts 45. The splining of the gears 56 on the shaft permits these gears to remain always in mesh with the gears 57 regardless of the adjustment of the cutters toward or away from each other and it is preferable to provide brackets 58 which operate to hold the gears in mesh, these brackets depending from the bearing 44. The shaft 55 also carries a sprocket 59 about which is trained a chain 60 which is in turn trained about a sprocket 61 on a counter-shaft 62. On the shaft 62 is a bevel gear 63 meshing with a bevel gear 64 on a second counter-shaft 65. Splined on the shaft 65 are bevel gears 66 which mesh constantly with bevel gears 67 on the shafts 38. The splining of the gears 66 permits them to mesh constantly with the gears 67 regardless of adjustment of the cutters and it is preferable to provide suitable brackets 68 for the purpose of holding the gears together.

Assuming that the cutters are in operation, the ingot to be trimmed is carried by the tongs B and deposited on the door 28. Water is then let into the lower one of the pipes 35 in the cylinder 30 whereupon the plunger rod 32 will be forced upwardly, swinging the door 28 into vertical position closing the previously open side of the cage

23. The ingot or billet then slides down the door 28 along the cage and engages the top most cutters 39. Water is admitted through the pipe 19 to the cylinder 18 and the plunger rod 21 is forced downwardly by the pressure until it engages the ingot, whereupon continued pressure will cause the ingot to be forced down between the pairs of rollers which operate to cut away all surface flaws, seams and other imperfections, so that when the billet reaches the discharge chute 53 it will be in proper condition to be run through the rolling mill.

From the foregoing description and a study of the drawings it will be apparent that I have thus provided a simply constructed and consequently easily controlled and operated trimming machine which will be very efficient for the purpose specified and which will be a great saver of time and labor and material, inasmuch as all the ingots or billets are reduced to the same size and to a perfect condition before being admitted to the rolling machine. Adjusting means has been provided to take care of all desired variations and to meet different conditions and as a consequence the machine proves to be highly satisfactory in performing all of its functions.

While I have shown and described the preferred embodiment of the invention it is of course to be understood that I reserve the right to make such changes in the form, construction and arrangement of parts as will not depart from the spirit of the invention as expressed by the scope of the subjoined claims.

Having thus described my invention I claim:

1. In an ingot trimming machine, a plurality of pairs of driven rotary cutters arranged at angles, guide means leading to the cutters, guide means leading from the cutters, and means for moving an ingot along the first named guide means and through and between the cutters whereby all four corners will be trimmed simultaneously.

2. In an ingot trimming machine, two pairs of rotary cutters arranged at right angles, drive means for rotating the cutters simultaneously, and means for feeding an ingot through the cutters, including a hydraulic cylinder provided with inlet and outlet pipes, and a piston within said cylinder carried by a plunger rod engageable with the ingot.

3. In an ingot trimming machine, a supporting frame, upper and lower pairs of cutters journaled therein, the cutters of one pair being arranged at right angles to those of the other pair whereby to act upon opposite sides of the ingot, means for rotating all of the cutters simultaneously, a guide cage carried by the frame in alignment with the opening between the cutters, chute means for leading an ingot into the cage and a hydraulic press carried above the frame and having a depending plunger entering the cage for feeding the ingot through the cutters.

4. In an ingot trimming machine, a supporting frame, upper and lower pairs of cutters journaled therein, the cutters of one pair being arranged at right angles to those of the other pair whereby to act upon opposite sides of the ingot, means for rotating all of the cutters simultaneously, a guide cage carried by the frame in alignment with the opening between the cutters, chute means for leading an ingot into the cage, and a hydraulic press carried above the frame and having a depending plunger entering the cage for feeding the ingot through the cutters, and means for adjusting the cutters toward or from each other whereby to vary the distance between them to accommodate ingots of different sizes.

5. In an ingot trimming machine, a supporting frame, upper and lower pairs of cutters journaled therein, the cutters of one pair being arranged at right angles to those of the other pair whereby to act upon opposite sides of the ingot, means for rotating all of the cutters simultaneously, a guide cage carried by the frame in alignment with the opening between the cutters, chute means for leading an ingot into the cage and a hydraulic press carried above the frame and having a depending plunger entering the cage for feeding the ingot through the cutters, the means for leading the ingot to the cage including a movably mounted member upon which the ingot is initially placed, and means for tilting the member to discharge the ingot therefrom.

6. In an ingot trimming machine, a frame, pairs of cutters journaled in the frame, means for rotating all the cutters simultaneously, a cage carried by the frame above the cutters and having an open side, a hingedly mounted door for covering the open side of the cage, said door being tiltable whereby to conduct an ingot thereon into the cage, and means above the cage for applying pressure upon an ingot therein.

7. In an ingot trimming machine, a frame, pairs of cutters journaled in the frame, means for rotating all the cutters simultaneously, a cage carried by the frame above the cutters and having an open side, a hingedly mounted door for covering the open side of the cage, said door being tiltable whereby to conduct an ingot thereon into the cage, means above the cage for applying pressure upon an ingot therein, and power means for tilting the door to discharge the ingot therefrom.

8. In an ingot trimming machine, a frame,

pairs of cutters journaled in the frame, means for rotating all the cutters simultaneously, a cage carried by the frame above the cutters and having an open side, a hingedly mounted door for covering the open side of the cage, said door being tiltable whereby to conduct an ingot thereon into the cage, means above the cage for applying pressure upon an ingot therein, power means for tilting the door to discharge the ingot therefrom, consisting of a hydraulic cylinder having inlet and outlet pipes, a piston movable within the cylinder and carried by a plunger, and a link pivotally connected with the plunger and with said door.

9. In an ingot trimming machine, a plurality of pairs of rotary cutters arranged to act upon all sides of an ingot forced therethrough, drive means for rotating the cutters, guide means extending to the opening between the cutters, and a pressure operated plunger extending through the guide means for forcing an ingot through the cutters.

In testimony whereof I affix my signature.

ALPHONSO DE CLAUDE KESSLER.