Jan. 8, 1929. 1,698,637

A. DE C. KESSLER

INGOT TRIMMING PRESS

Filed Oct. 5, 1923 5 Sheets-Sheet 1

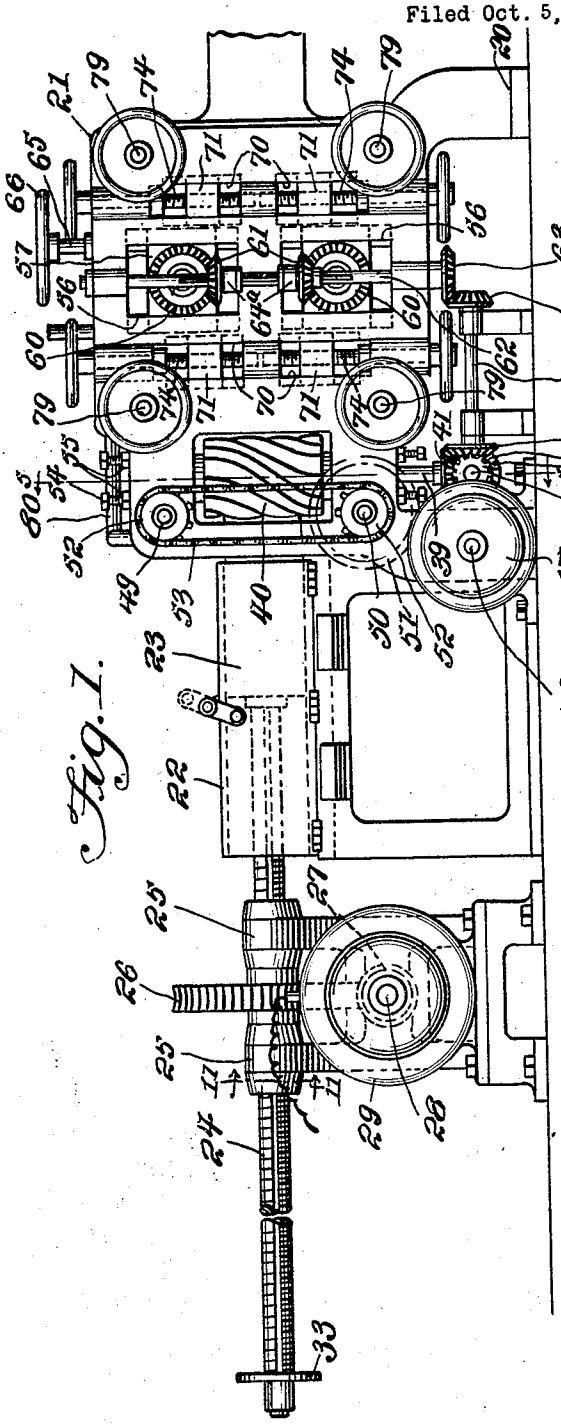


Fig. 1.

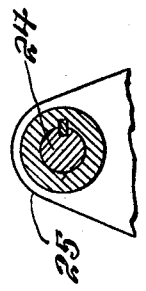


Fig. 11.

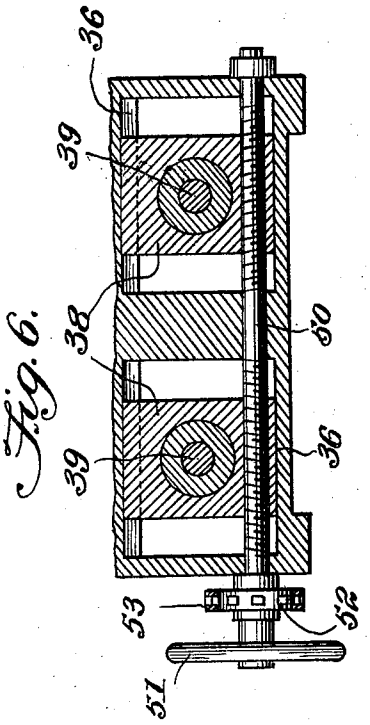


Fig. 6.

WITNESS:

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INGOT TRIMMING PRESS

Filed Oct. 5, 1923 5 Sheets-Sheet 2

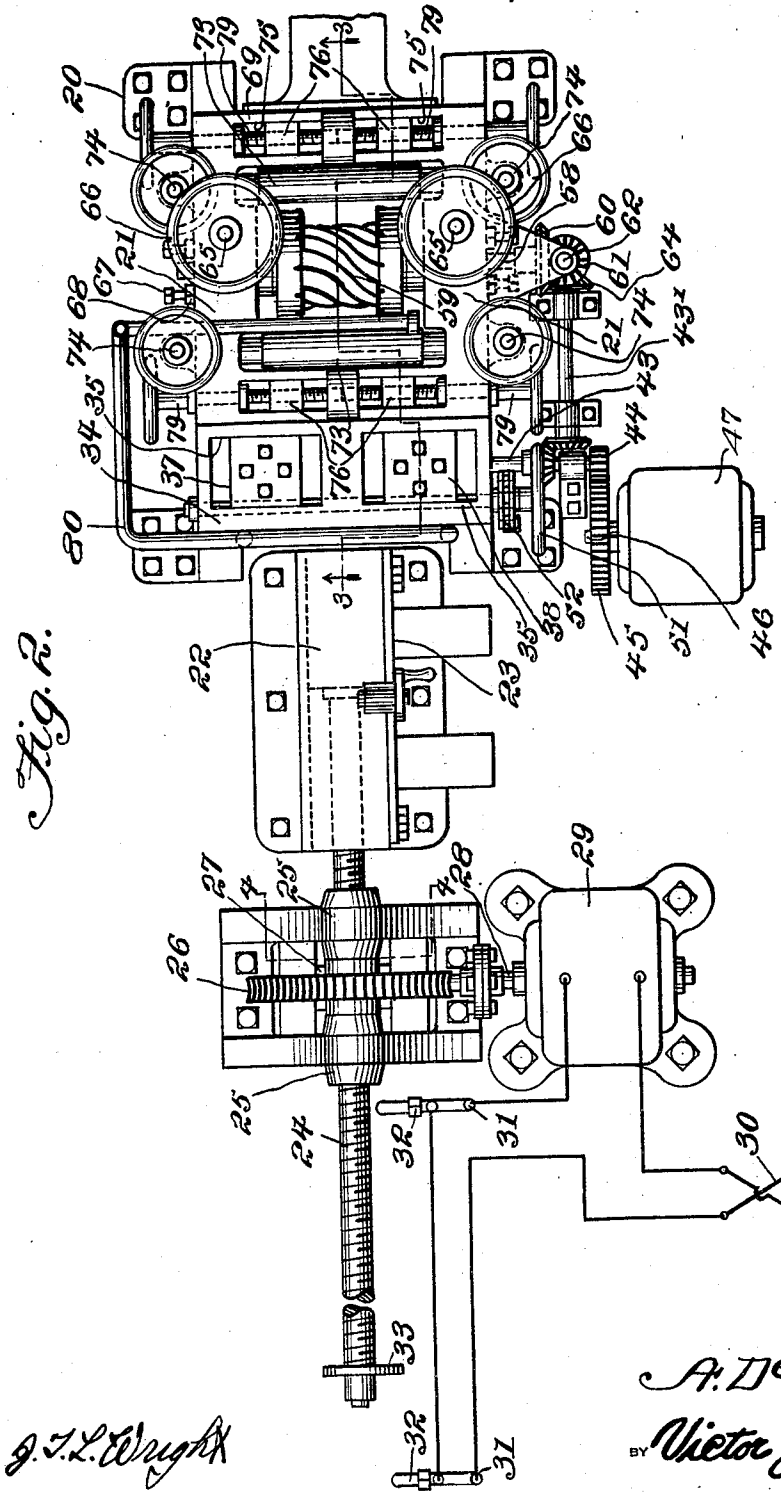


Fig. 2.

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INGOT TRIMMING PRESS

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Fig. 3.

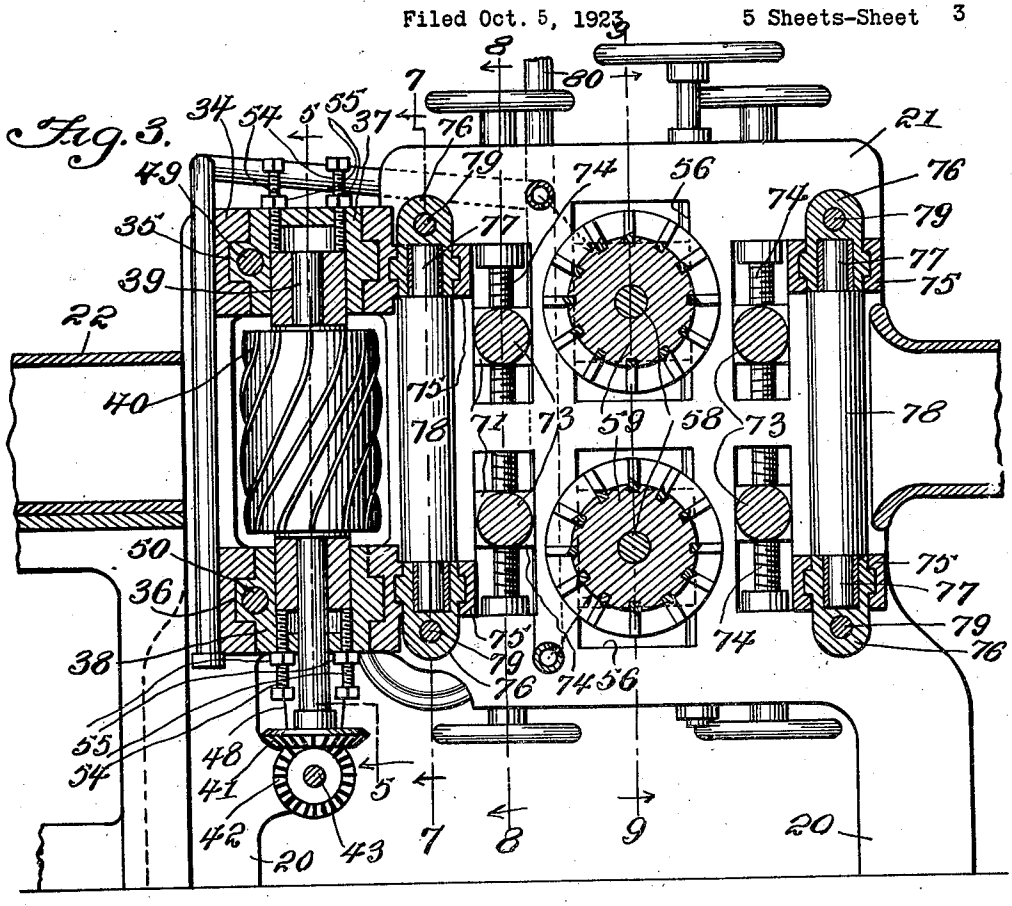
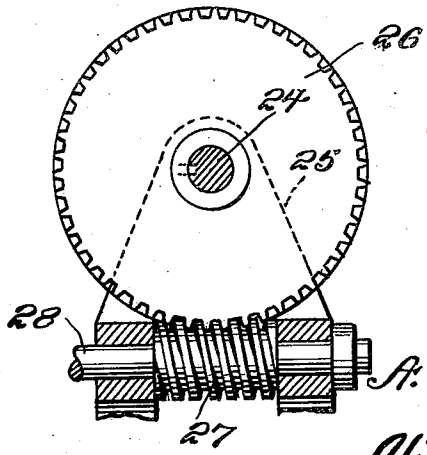


Fig. 4.



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INGOT TRIMMING PRESS

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Fig. 5.

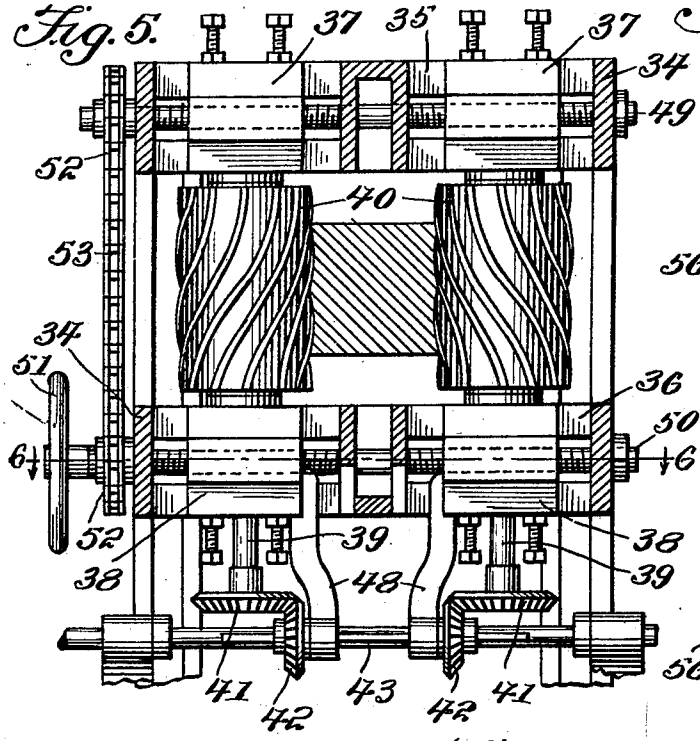


Fig. 10.

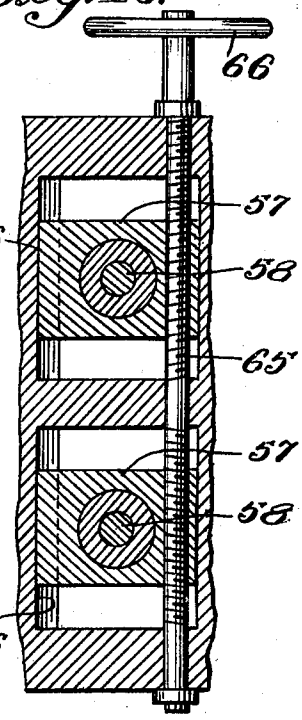
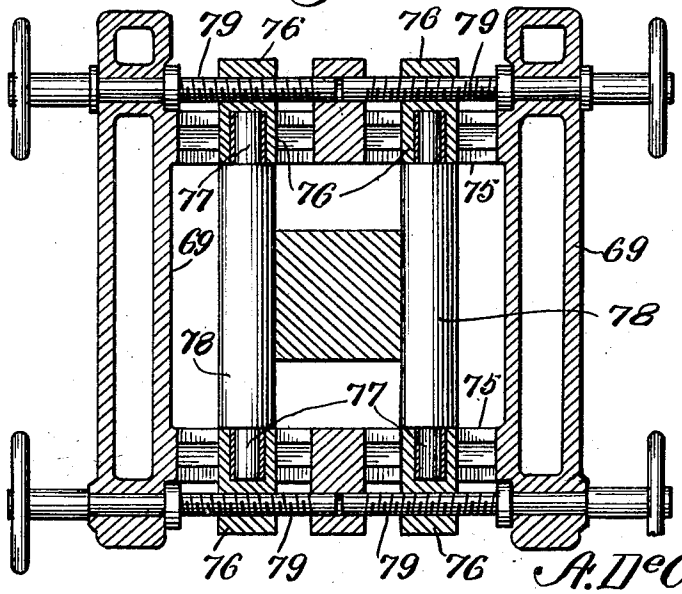


Fig. 7.



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INGOT TRIMMING PRESS

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Fig. 8.

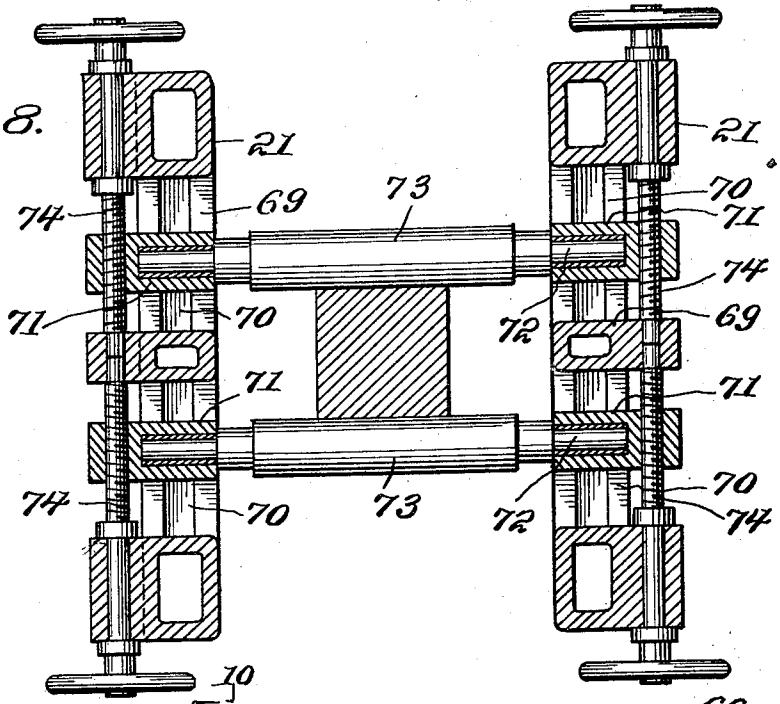
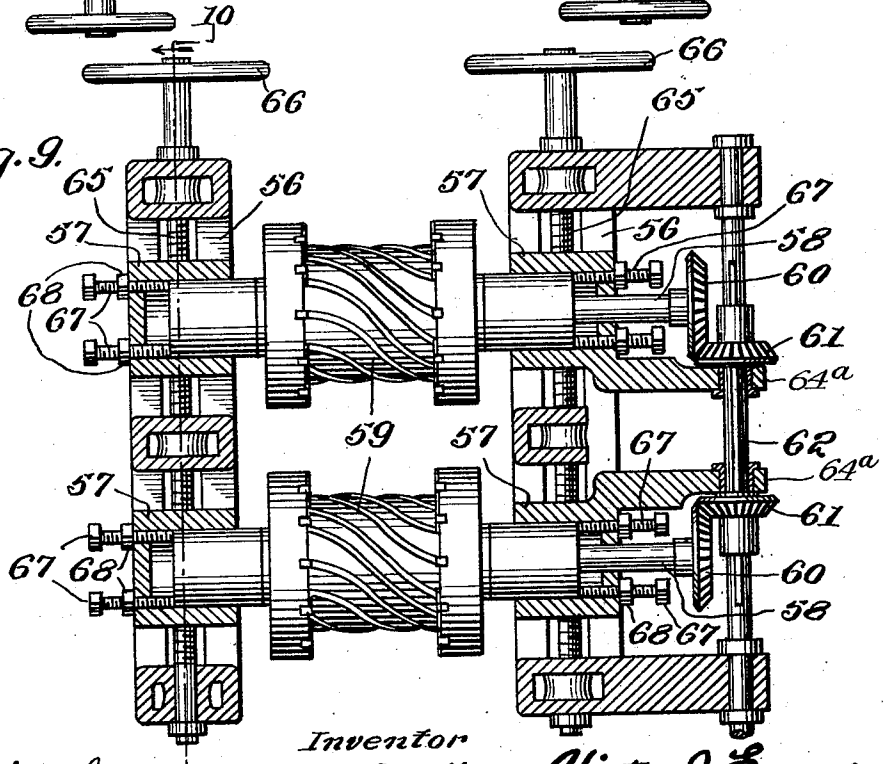


Fig. 9.



Inventor

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J. L. Wright

WITNESS:

Patented Jan. 8, 1929. 1,698,637

UNITED STATES PATENT OFFICE.

ALPHONSO DE CLAUDE KESSLER, OF DUNKIRK, NEW YORK.

INGOT-TRIMMING PRESS.

Application filed October 5, 1923. Serial No. 666,787.

This invention relates to trimming machines and has for its object the provision of a novel device for removing all surface flaws and seams from iron or steel bars, billets, ingots and the like so that the billet or ingot will be in proper condition to be passed to the rolling mill.

An important and more specific object is the provision of a machine of this character which is equipped with a screw operated power driven plunger for forcing the bar or ingot through a plurality of vertical and horizontal cutters which are constantly rotated and which operate to remove surface imperfections.

Another object is the provision of a machine of this character in which spray means is provided for cooling the cutters during their action and thus preventing them from becoming overheated to such an extent as to destroy the temper.

Still another object is the provision of a novel means for adjusting the various rollers toward or from each other depending upon the size of the bar or ingot and depending upon the depth of cut desired, other means being provided for positively centering the various cutters.

A further object is the provision of guide rollers through which the bar or ingot passes after leaving the cutters, these guide rollers being also adjustable to correspond with the positions of the cutters.

An additional object is the provision of a machine of this type which will be comparatively simple in construction, easy to control and operate, efficient in action, 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 side elevation of the complete machine,

Figure 2 is a top plan view thereof,

Figure 3 is a section on the line 3—3 of Figure 2,

Figure 4 is a detail section on the line 4—4 of Figure 2,

Figure 5 is a vertical section on substantially the line 5—5 of Figure 1,

Figure 6 is a horizontal section on the line 6—6 of Figure 5,

Figure 7 is a vertical section on the line 7—7 of Figure 3,

Figure 8 is a vertical section on the line 8—8 of Figure 3,

Figure 9 is a vertical section on the line 9—9 of Figure 3,

Figure 10 is a section on the line 10—10 of Figure 9, and

Figure 11 is a detail section on the line 11—11 of Figure 1.

Referring more particularly to the drawings I have shown my device as comprising a main supporting frame or base 20 upon which is mounted the auxiliary frame member and superstructure needed for supporting the various elements of the mechanism. This structure includes, in part, upstanding frame members 21 which carry the various cutters and guide rollers to be described, and in advance of these frame members is a guide casing 22 within which is placed the billet, bar or ingot to be trimmed, and this casing is provided with a hinged cover or door 23 permitting access to the interior, the door being equipped with suitable holding means for maintaining it closed when desired.

The means for moving the bar or billet along this casing consists of an elongated shaft 24 which is threaded to define a plunger screw and which is slidable through guides 25 on the main frame. Screwed onto this shaft but restrained from longitudinal movement with respect thereto is a worm wheel 26 with which meshes a worm 27 on the shaft 28 of an electric motor 29 of any ordinary or preferred type and of proper horse power. This motor is of the reversible type and is equipped with a reversing switch 30 likewise of conventional pattern. Interposed in the circuit between the source of current and the motor is a cut off switch 31 which includes a movable element 32 disposed in the path of travel of a stop 33 carried by the shaft 24 so that when the shaft has been moved to the maximum extent desired the engagement of the stop 33 with the element 32 will cut off the current. If preferred, this stop arrangement might be used for automatically reversing the motor at the end of the movement of the feed screw shaft.

In advance of and either secured to or formed integrally with the frame members 21 is a frame 34 formed with horizontal guides 35 and 36 within which are slidable

pairs of bearings 37 and 38 respectively. Journaled through the corresponding bearings 37 and 38 are upright shafts 39 which carry cutters 40. On the lower ends of these shafts are beveled gears 41 which mesh with beveled gears 42 on a horizontal shaft 43 driven in any desired manner. The shaft 43 is the main drive for the entire mechanism and is here illustrated as equipped with a gear 44 with which meshes a pinion 45 on the shaft 46 of an electric or other motor 47. The gears 42 are splined upon the shaft 43 so as to permit sliding movement when the bearings 37 and 38 are adjusted by the means to be described, and the gears 41 and 42 are held always in mesh owing to the provision of arms 48 which depend from the bearings 38 and which slidingly engage upon the shaft 43.

For effecting adjustment of the cutters 40 toward or from each other, I provide upper and lower horizontal screws 49 and 50 associated respectively with the guides 35 and 36. These screws have their end portions oppositely threaded so that when they are rotated in one direction the bearings through which they pass will be moved together and when they are rotated in the opposite direction the bearings will be moved apart. One screw, the lower one 50, is here shown as equipped with a hand wheel 51 by means of which it may be turned and both screws carry sprockets 52 about which is trained a chain 53 which operates to turn the upper screw when the lower one is turned manually.

It is important that means be provided for bringing the center lines of these cutters in exact alignment and to accomplish this I make the bearings 37 and 38 of a peculiar construction so as to embody a movable section engaged by set screws 54 equipped with lock nuts 55. This adjustment of the bearings is independent of the above described double ended screw adjustment and is only for the purpose of insuring alignment of the centers, the first described adjustment being provided for varying the distance between the cutters for working upon ingots or billets of different sizes or for regulating the depth of cut made by the rotary cutters.

The frame members 21 are formed with vertical guides 56 within which are slidable pairs of bearings 57 which are very similar in construction to the bearings 37 and 38 and which carry horizontal shafts 58 on which are mounted rotary cutters 59 which are for trimming the top and bottom surfaces of the bar or ingot. On the ends of the shafts 58 are beveled gears 60 which mesh with beveled gears 61 splined on a vertical drive shaft 62 which is equipped at its lower end with a beveled gear 63 meshing with a beveled gear 64 on the main drive shaft 43. The splining of the gears 61 on the shaft 62 permits the gears 60 and 61 to remain always in mesh regardless of the adjustment of the bearings 57 and the bearings carry arms 64^a engaging the gears 61 for holding them in mesh with the gears 60. The adjusting means in this instance consists of vertical screws 65 located within the guides 56 and having their end portions oppositely threaded and screwed through the bearings 57. The upper ends of these screws are equipped with hand wheels 66 which are individually rotatable to adjust the cutters 59 to the desired distance apart. To insure alignment of the center lines of these cutters 59, the bearings are peculiarly constructed to have movable portions engaged by set screws 67 equipped with lock nuts 68.

For conducting the bar or ingot through the entire device, I provide a set of guide rollers which are adjustable to correspond to the adjustment of the cutters. This feature includes the provision of frame members or portions 69 located rearwardly of the frames 21 though they may be formed integrally with these frames 21 if preferred, such details being immaterial. The frames or frame portions 69 are formed with vertical guides 70 within which are slidable bearings 71 carrying shafts 72 on which are rollers 73. The bearings 71 are held in adjusted position by screws 74 journaled in the upper and lower portions of the frames 69 and threaded through the bearings 71. The frame structure 69 is also formed with horizontal guides 75 within which are slidable bearings 76 carrying shafts 77 on which are mounted vertical rollers 78. Screwed through the frame are other screws 79 which are threaded through the bearings 76 for adjusting the vertical rollers toward or from each other.

In the operation the hot ingot, bar or billet is placed within the casing 22 and the door 23 is closed. The motor 29 is set in operation and acts to rotate the worm wheel 26 which acts as a nut for advancing the screw plunger 24. This plunger enters the casing 22, engages the bilet or ingot and forces it between the constantly rotating vertical cutters 40 and horizontal cutters 59. All the cutters positively rotate in opposition to the travel of the bar or ingot and consequently they operate to remove all surface roughnesses, flaws, seams and other defects so that the billet or ingot will be in proper condition to be conducted to the rolling machine where its size is to be reduced in the usual manner. As there is danger of overheating of the cutters, I provide a series of pipes 80 located at the desired points and suitably supported from the frame members, and these pipes 80 are perforated as shown to project jets or streams of water onto the cutters as they rotate. Any suitable source

of water power is connected with the pipes.

After leaving the cutters, the trimmed bar or ingot passes through the set of horizontal and vertical rollers 73 and 78 and then to whatever rolling machine is used. The various adjustment features have been described above and a reiteration is believed to be unnecessary. It might be well to state that the guide rollers hold the billet in a true position while the first set of cutters are in operation. The guide rollers also act as a guide for the nose of the bar or billet to convey the same in a true and straight line to the last set of cutters, the rollers also acting to hold the bar or billet against switching either up, down or side ways while the cutters are effecting or exerting their trimming action.

From the foregoing description and a study of the drawings it will be apparent that I have thus provided a simply constructed and very easily controlled and operated machine which will most effectually trim ingots and the like ready for subsequent treatment. Practically every contingency has been anticipated and adjustment and compensation allowed therefor so that the device should be capable of performing its function in a most highly satisfactory manner.

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 or the scope of the subjoined claims.

Having thus described my invention I claim:

1. In an ingot trimming press, a pair of rotating vertical cutters, a pair of horizontal cutters, a set of guide rollers located rearwardly of the cutters and corresponding thereto, a support for the ingot to be trimmed, said support being located in advance of the cutters and means for forcing an ingot along said support and through the cutters and rollers, comprising a plunger entering the support and power operated screw means for advancing said plunger.

2. In an ingot trimming press, a pair of rotating vertical cutters, a pair of horizontal cutters, a set of guide rollers located rearwardly of the cutters and corresponding thereto, a support for the ingot to be trimmed, said support being located in advance of the cutters and means for forcing an ingot along said support and through the cutters and rollers, comprising a plunger entering the support and power operated screw means for advancing said plunger, said support being formed as a casing having a movable portion permitting access to the interior.

3. In an ingot trimming press, a pair of rotating vertical cutters, a pair of horizontal cutters, a set of guide rollers located rearwardly of the cutters and corresponding thereto, a support for the ingot to be trimmed, said support being located in advance of the cutters and means for forcing an ingot along said support and through the cutters and rollers, and means for adjusting the pairs of cutters toward or from each other, means for adjusting the rollers toward or from each other in correspondence with the adjustment of the cutters.

4. In an ingot trimming press, a pair of rotating vertical cutters, a pair of horizontal cutters, a set of guide rollers located rearwardly of the cutters and corresponding thereto, a support for the ingot to be trimmed, said support being located in advance of the cutters and means for forcing an ingot along said support and through the cutters and rollers, the cutters being mounted upon shafts, bearings for said shafts, and guides within which said bearings are adjustably mounted whereby to regulate the distance between the pairs of rollers.

5. In an ingot trimming press, a pair of rotating vertical cutters, a pair of horizontal cutters, a set of guide rollers located rearwardly of the cutters and corresponding thereto, a support for the ingot to be trimmed, said support being located in advance of the cutters and means for forcing an ingot along said support and through the cutters and rollers, the cutters being mounted upon shafts, bearings for said shafts, guides within which said bearings are slidably mounted, and screw means engaging the bearings for adjusting the cutters toward or from each other.

6. In an ingot trimming press, a pair of rotating vertical cutters, a pair of horizontal cutters, a set of guide rollers located rearwardly of the cutters and corresponding thereto, a support for the ingot to be trimmed, said support being located in advance of the cutters and means for forcing an ingot along said support and through the cutters and rollers, the cutters being mounted upon shafts, bearings for said shafts, guides within which said bearings are slidably mounted, and screw means engaging the bearings for adjusting the cutters toward or from each other, the screw means including screws provided with means to effect rotation thereof, the screws having their ends oppositely threaded and screwed through the bearings.

7. In an ingot trimming press, a pair of rotating vertical cutters, a pair of horizontal cutters, a set of guide rollers located rearwardly of the cutters and corresponding thereto, a support for the ingot to be trimmed, said support being located in advance of the cutters and means for forcing an ingot along said support and through the

cutters and rollers, the cutters being mounted upon shafts, bearings for said shafts, guides within which said bearings are slidably mounted, and screw means engaging the bearings for adjusting the cutters toward or from each other, and means associated with the bearings for shifting the cutters longitudinally to bring their center lines in alignment.

8. In an ingot trimming press, pairs of cutters arranged with their axes in parallel relation and adapted to act upon opposite sides of an ingot or bar, bearing members, the cutters having reduced trunnions thereon engaged within the bearing members, and screw means for moving the bearing members toward and from each other.

9. In an ingot trimming press, a supporting structure, cutters mounted therein and having reduced trunnions at their ends, guide rollers located in advance of the cutters and likewise having reduced trunnions at their ends, bearing members for the respective trunnions, and means for correspondingly adjusting the rollers and cutters including screw members arranged with their axes at right angles to the axes of the cutters and rollers, said screw members being threaded through said bearing members, means for adjusting the cutters longitudinally, and means for forcing an ingot through the rollers and cutters.

In testimony whereof I affix my signature.

ALPHONSO DE CLAUDE KESSLER.