Oct. 10, 1939. E. SCHÜTZ 2,175,574

METHOD AND DEVICE FOR PRODUCING STRAIGHT METAL BARS FROM CENTRIFUGALLY CAST INGOTS

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Fig. 1.

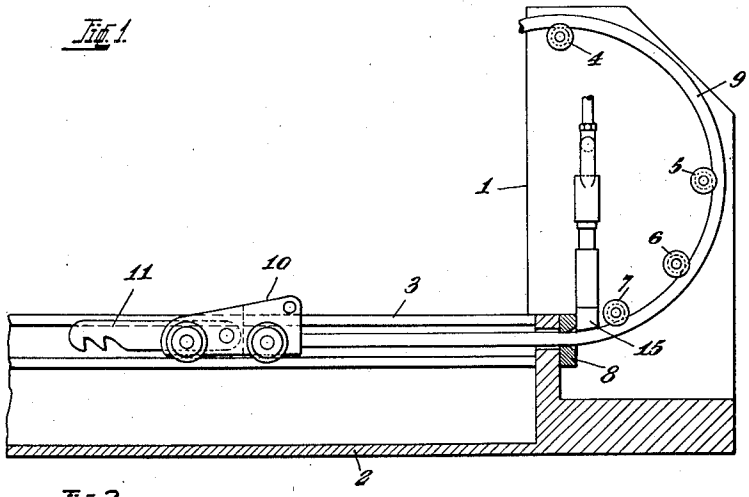


Fig. 2.

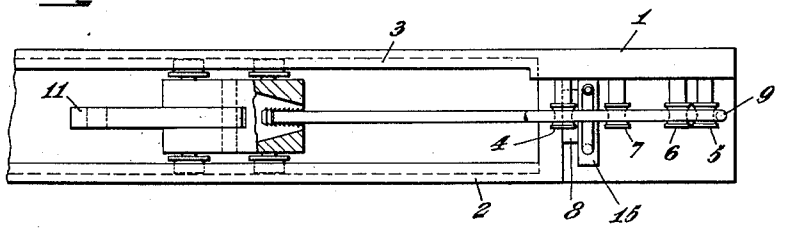


Fig. 3.

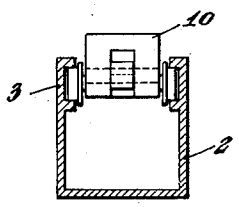
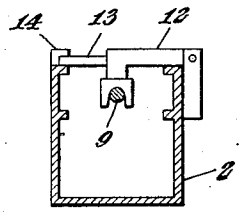


Fig. 4.



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Fig. 5.

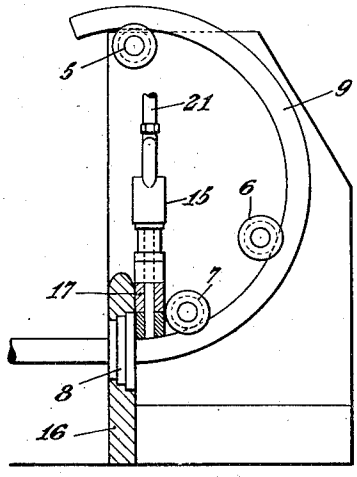


Fig. 6.

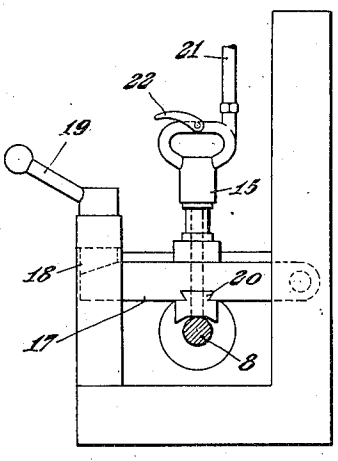


Fig. 7.

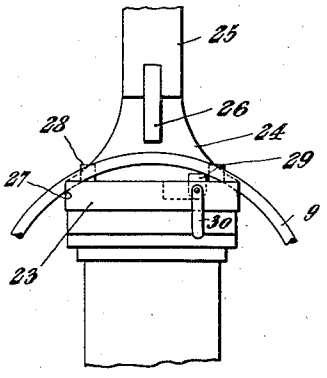
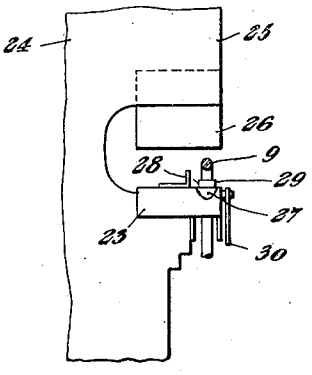


Fig. 8.



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UNITED STATES PATENT OFFICE

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METHOD AND DEVICE FOR PRODUCING STRAIGHT METAL BARS FROM CENTRIFUGALLY CAST INGOTS

Edwin Schütz, Baden, Switzerland

Application October 20, 1937, Serial No. 170,125
In France January 26, 1937

6 Claims. (Cl. 29—33)

The present invention has for its subject a method and a device for the further treatment of moulded annular articles, in particular those which are cast as annular bodies by a centrifugal method.

According to the present invention a method for the further treatment of annular metal moulded articles, in particular those which have been cast by the centrifugal process, as annular bodies, is characterised in that the pouring burr which projects beyond the desired cross-sectional profile of the ring is removed from the annular moulded articles, that the ring is cut at a point, then approximately straightened at least at one of its ends, for the purpose of being introduced, into the matrix of a drawing bench, whereupon it is converted into an approximately straight rod by drawing through the matrix.

The device comprises a rotary plate, on which the ring is secured after removal of the pouring burr from the inner face of the ring and equalisation of this face, pressure rollers for producing a compression of the material adjacent said inner face, a circular saw for cutting the ring, a press for substantially straightening at least one end of the ring, a drawing bench with a device for feeding the ring, the inner side of the latter being preferably turned upwardly, and a compressing device by means of which the material can be compressed on the inner face of the ring.

In order that the invention may be more clearly understood reference will now be made to the accompanying drawings which show by way of example preferred embodiments thereof.

In the drawings:

Fig. 1 shows in side view the drawing bench with the securing device and the compressing device.

Fig. 2 is a plan view of Fig. 1.

Figs. 3 and 4 show details.

Figs. 5 and 6 show the device for compressing the material on the inner side of the rod.

Figs. 7 and 8 show the straightening device, in front view and in side view.

In the drawings like references designate the same or similar parts.

The moulded rings obtained from the centrifugal device have a pouring burr which projects from the inner side of the ring and extends beyond the desired profile and which, preferably, should not participate in the further treatment. For removing this part the ring is secured, for example, to the plate of a known horizontal lathe or other similar device, the inner side being left free, the pouring burr being removed by machining or cutting and the profile being brought to the predetermined dimension. In special cases the profile may be machined before the further treatment. After the machining there may be effected a compression of the inner side of the ring by rolling or the like, unless it is preferred to combine this operation with another. The correctly profiled metal ring is then cut at a point with a known circular saw and one of the two ends is approximately straightened on an eccentric press, by using the device which is shown in Figs. 7 and 8, so that it can be introduced easily into the matrix of a drawing bench. The device is mounted on the table 23 of an eccentric press 24 with a carriage 25 which carries the straightening plunger 26. The edges of the table 23 are rounded on both sides 27 and serve, in combination with the angle pieces 28, secured rearwardly to the table, to guide the ring 9 and also serve as bearing points in the straightening of the latter. Into the table is fitted the straightening segment 29 which may be raised or lowered by means of the handle 30. For straightening the outer end of the ring the straightening segment 29 is raised by rocking the handle 30 and the end of the ring is then placed, with one of its sides, on the left hand edge of the table 27 and on the segment 29, whereupon, as a result of the engagement of the carriage 25, the straightening plunger is lowered and straightens by pressure the curved portion of the ring. It is also possible to use the device for approximately straightening the cut ring before its introduction into the drawing bench by suitably adjusting the descent of the plunger and by turning the ring step by step after each downward movement of the plunger by a fraction of a revolution corresponding, for example, to the width of the table, according to the thickness of the ring and the expansion of the material. This device may also be used in combination with an anvil, secured to the table for compressing the inner side of the ring and for stretching the ring.

The approximately straightened rod of material thus obtained can be cut into small pieces and these can be pressed, forged or the like, in the cold or after being heated, into the final shape. When straightened rods of accurate profile are to be produced the ring prepared in the manner above described is placed on the device located at one end of the drawing bench 2 which is shown in Figs. 1 to 4. On the column 1 of this bench are mounted rotatably rollers 4, 5, 6 and 7 which guide the ring and produce slow opening thereof. The ring is placed and is introduced into the

drawing bench in such a manner that, on this position its inner side is turned, for example, upwardly. The end straightened on the eccentric press is then passed through the matrix or drawing ring 8 and tightened in the jaw of the carriage 10 of the drawing bench. This is drawn towards the left in the drawing, in the known manner, by means of a chain or the like in which is hooked the hook 11 of the carriage and by this means the ring 9 is converted into a rod with simultaneous reduction of its cross-section. For the purpose of guiding along a straight line the carriage 10 with its rollers on the jaw 3, this carriage is guided in an inwardly open U-channel of the jaw. Further there is secured to the bench 2, in the pulling direction, between the carriage 10 and the matrix 8, a device consisting of a holder 12, for preventing accidents, which is held by an extension 13 in a U-shaped member 14, in such a manner that when the rear end of the ring 9 leaves the matrix, the rod cannot, under the action of its elasticity and its tension, rebound towards the carriage and turn over.

A compressed air hammer 15 may be located in front of the matrix 8. This device is shown to a larger scale in Figs. 5 and 6. It is secured, so as to be capable of being raised, at the head 16 of the drawing bench 1 so as to be capable of rocking on a strap 17 and may be secured in the operative position by the bolt 18 with the lock nut 19. The hammer 15 strikes, with its plunger 20, on the inner face of the ring 9 and compresses and stretches the material of the ring at this point so that when straightening and stretching the ring at this point the formation of cracks is obviated. The hammer is actuated by compressed air which is supplied through the flexible pipe 21, and the valve 22. It will be understood that the hammer may be actuated by an electric motor or mechanically or that it may be replaced by a roller at the point at which the adjacent straightening rollers effect the simultaneous straightening and drawing of the ring. By the straightening and drawing operation it is possible in this manner at the same time to modify the cross-section of this latter.

I claim:

1. The herein described method for producing straight metal bars from centrifugally cast annular ingots, which method comprises removing the burr which projects beyond the desired cross-section of the ring, cutting the ring at one point, substantially straightening the ring at one end thereof, introducing the straightened end into the matrix of a drawing bench, compressing the material of the inner ring face immediately before said matrix, and drawing the ring through said matrix.

2. In a device for producing straight metal bars from annular centrifugally cast ingots, cut open and straightened at one end of the cut ring, a drawing bench having a matrix, means for feeding the ingot to said matrix and means for compressing the material of the inner ingot face immediately before said matrix.

3. A device, as claimed in claim 2, in which said compressing means comprises a hammer actuated by an automotive force.

4. A device, as claimed in claim 2, in which said compressing means comprises a hammer actuated by pressure air.

5. A device, as claimed in claim 2, in which said compressing means comprises a pair of pressure rollers.

6. A device, as claimed in claim 2, in which said means for feeding the ingot to the matrix comprises a plurality of spaced rollers arranged to produce a gradual opening of the cut ring.

EDWIN SCHÜTZ.