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T. M. GIRDLER

INGOT MOLD

Filed April 9, 1923

FIG. I.

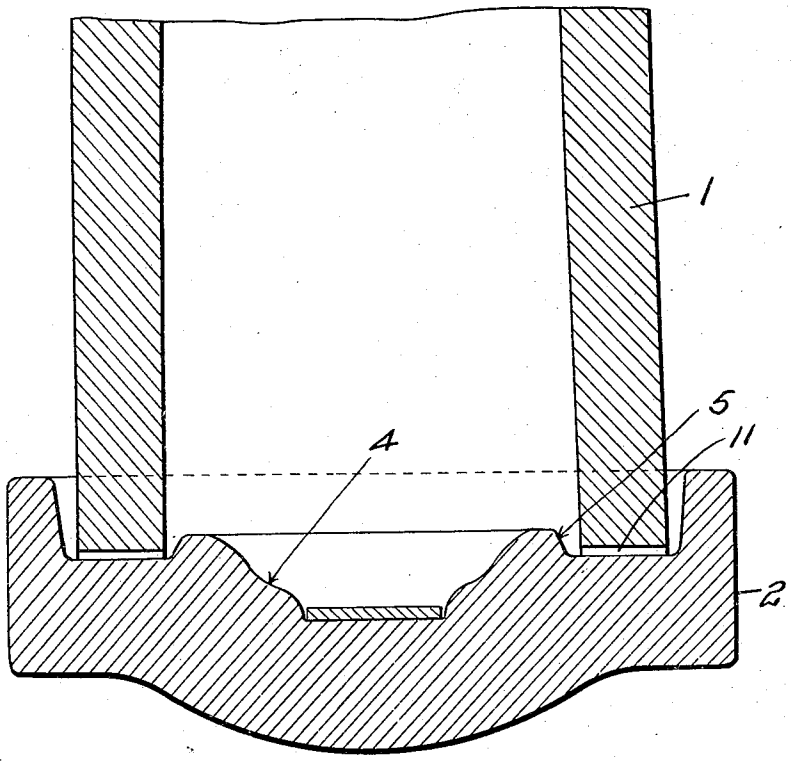
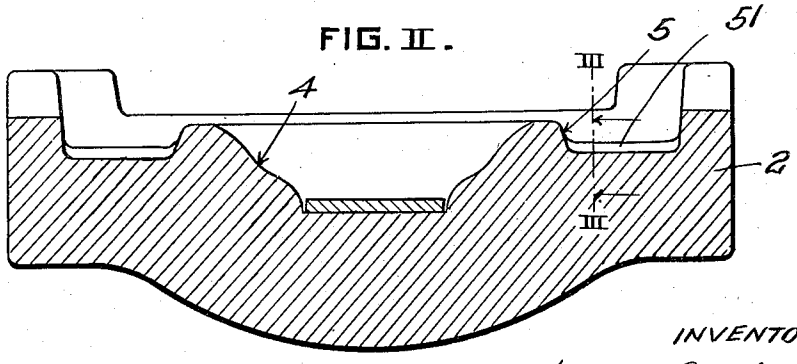


FIG. III.



FIG. II.



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UNITED STATES PATENT OFFICE.

TOM M. GIRDLER, OF WOODLAWN, PENNSYLVANIA.

INGOT MOLD.

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To all whom it may concern:

Be it known that I, TOM M. GIRDLER, residing at Woodlawn, in the county of Beaver and State of Pennsylvania, a citizen of the United States, have invented or discovered certain new and useful Improvements in Ingot Molds, of which improvements the following is a specification.

My invention relates to improvements in ingot molds, and particularly to molds in which steel is cast, to form ingots for rolling. The object of improvement is to reduce waste in the form of crop ends upon the rolled article.

In the accompanying drawings Fig. I is a view in vertical and medial section of the lower portion of an ingot mold in which my invention is embodied. Fig. II is a view corresponding to Fig. I, but showing the stool portion only of the mold, and illustrating a variation in detail of construction. Fig. III is a fragmentary view in vertical section, on a plane at right angles to that of Fig. II, of the stool portion of the mold. The plane of section is indicated by the line III—III, Fig. II.

An ingot mold for casting steel ingots includes in its structure stool and mold body. The mold body is a heavy casting of columnar shape, ordinarily approximately square in cross-section, but with rounded corners, tapering somewhat from bottom to top, and open at its ends. This mold body is, in preparation for casting, set on the stool portion, which as its name implies is the supporting member, constituting the floor of the mold and carrying the mold body in vertical position. In the drawings the mold body is indicated at 1 and the stool at 2. Fig. I shows the parts assembled in position for casting, and the assembly will at a glance be understood.

Ordinarily the stool is merely a plane surfaced table-like block, essentially square, and of proper size, and provided with four upstanding angular projections with upwardly flaring opposite walls, projections such as are indicated at 3 in Fig. II, which serve to guide the heavy casting 1 which constitutes the mold body, and bring it accurately to place, when the mold parts are being assembled, preparatory to casting.

In the use of the ordinary ingot mold, with plane-faced stool, the ingot which is cast is of course square-ended, and this when it is rolled manifests that phenomenon called in the industry "fish-tailing." That is to say, the plastic body under the action of the rolls elongates unequally; there is more displacement longitudinally of the article near the surface than toward the center. Consequently as the body is rolled to billet or other shape there is at the end a considerable portion which is hollow; the superficial parts have elongated relatively and the central part has receded. This accidental shape in section resembles somewhat a fish's tail; hence the term. This hollow fish-tailed end must be cut off as scrap.

In order to correct this, and to diminish the length of the fish-tail, or even to eliminate it wholly, the stool of the mold has, by a now patented invention, been recessed centrally with a saucer-like recess, such as that shown in the drawings and marked 4. The effect of such a recess is to produce an ingot with a centrally protruding end, spoken of as a "bud." And the shape is such that the central protrusion makes compensation, more or less complete, for superficial over-rolling, and in the finished article there is relatively little fish-tailing, or perhaps none. And consequently there is not nearly so much cropping off of scrap.

But even with the mold so improved there is still a very appreciable loss in cropped-off scrap, and this the mill operator would gladly correct. My invention concerns correction, and saving of this still persisting loss.

The loss is chiefly due to the fin which inevitably forms in the seam, where the mold body rests upon the stool. The hot metal in casting creeps into this seam. And this fin is in the subsequent rolling a source of irregularity, such as to produce, even with the use of the recessed stool, still an undesirable amount of scrap in crop ends.

My invention consists in forming a channel, sunk into the surface of the stool, into which the mold body at its lower end extends, and within which the mold body rests and is supported. The joint so formed is capable of being luted or otherwise sealed with suitable material, to the end that the lower corner of the ingot cast in the mold will be smooth, and free of projecting fin. The ingot cast in the mold of my invention rolls down to an article free of defect because of terminal fin, and, if my invention

