Nov. 18, 1941. M. MORGAN 2,262,900

REEL

Filed Oct. 16, 1939

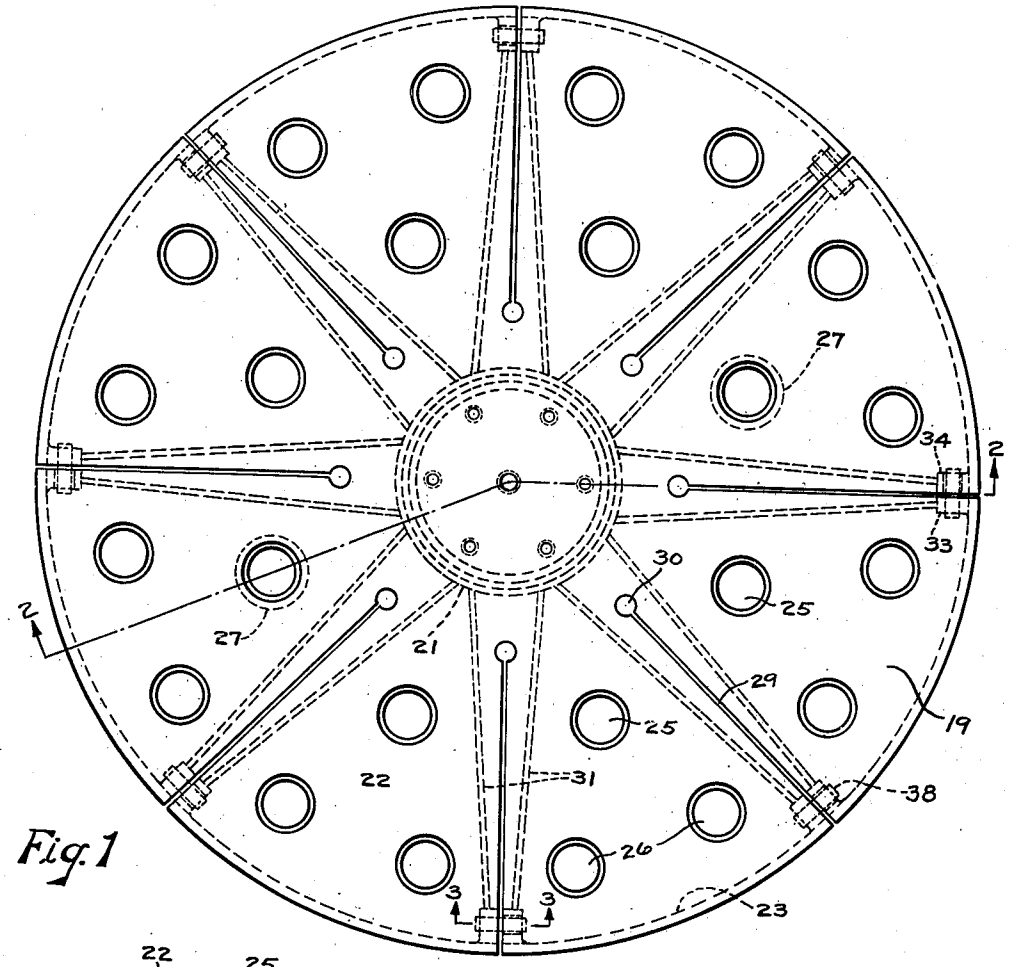


Fig. 1

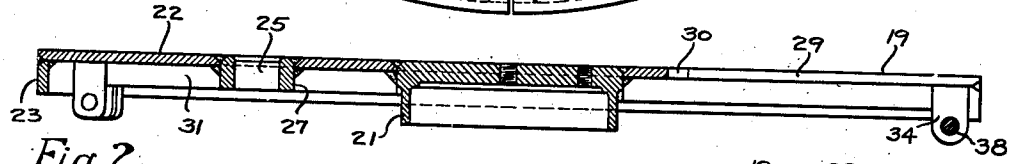


Fig. 2

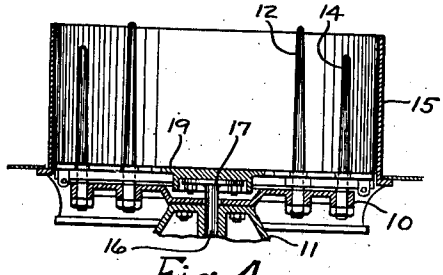


Fig. 4

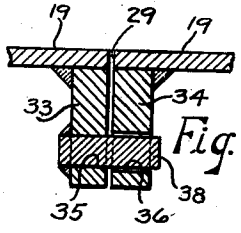


Fig. 3

INVENTOR
MYLES MORGAN
BY Albert G. Blodgett
ATTORNEY

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REEL

Myles Morgan, Worcester, Mass., assignor to Morgan Construction Company, Worcester, Mass., a corporation of Massachusetts

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6 Claims. (Cl. 242—83)

This invention relates to reels, and more particularly to the construction and arrangement of an improved coil plate for use with reels adapted for coiling hot metal bars.

In the coiling of wire rods and similar elongated metal products as they are delivered by a rolling mill, it is a common practice to utilize so-called "pouring" reels. A reel of this type ordinarily comprises a horizontal circular coil plate which can be rotated about a vertical axis, this plate having holes therein through which inner and outer rows of pins may extend upwardly. The hot metal stock is delivered to the annular space between the two rows of pins, so that the coil as it is being formed rests upon an annular area of the coil plate. This annular area of the plate becomes very hot, whereas the central and outer portions of the plate remain comparatively cool, and this unequal heating of the plate causes warping, buckling, excessive and non-uniform growth of the metal, and eventual cracking and destruction of the plate. The problem is rendered even more difficult by the fact that the rotation of the plate must be stopped to permit removal of each completed coil, and the coil plate must therefore be made as light as possible in order to avoid excessive inertia effects in the starting and stopping thereof.

It is accordingly one object of the invention to overcome these difficulties and to provide a coil plate adapted for use in a pouring reel for coiling hot metal bars and capable of operating in a satisfactory manner throughout a long life of service.

It is a further object of the invention to provide a coil plate of comparatively light construction capable of withstanding the effect of hot metal stock thereon without harmful warping, buckling or cracking.

With these and other objects in view, as will be apparent to those skilled in the art, the invention resides in the combination of parts set forth in the specification and covered by the claims appended hereto.

Referring to the drawing illustrating one embodiment of the invention and in which like reference numerals indicate like parts,

Fig. 1 is a top plan view of a coil plate for a pouring reel;

Fig. 2 is a section on the line 2—2 of Fig. 1;

Fig. 3 is an enlarged section on the line 3—3 of Fig. 1; and

Fig. 4 is a small scale vertical sectional view of a pouring reel.

In Fig. 4 there is shown a pouring reel comprising a pin plate 10 supported on the upper end of a rotatable quill 11, this quill being driven by suitable means (not shown). From the pin plate 10 an inner circle of pins 12 and an outer circle of pins 14 extend upwardly, these pins being surrounded by a stationary upright cylindrical casing 15. A vertical rod 16 extends upwardly through the quill 11, and this rod has a flange 17 on its upper end to which there is secured a coil plate 19. This coil plate is apertured so that the pins 12 and 14 may extend upwardly therethrough. By rotating the quill 11 and delivering the hot metal bars from a rolling mill into the annular space between the two rows 12 and 14 of revolving pins, a coil will be formed in a well-known manner. The coil will rest upon the coil plate 19 therebeneath, and upon completion of the coil the rotation of the parts will be stopped and the coil plate 19 will be raised by means of the rod 16 to bring the upper surface of the coil plate slightly above the tops of the pins 12, as is the common practice to allow removal of the coil laterally from the coil plate without interference with the pins.

The present invention has to do with the construction of the coil plate 19, and in the preferred embodiment illustrated this plate is formed of several parts which are connected by welding into an integral structure, but it will be understood that other methods of manufacture may be employed. The improved coil plate comprises a central hub 21 adapted to be secured to the flange 17, this hub being welded to a surrounding annular plate 22 having a depending flange 23 at its outer edge. These parts form a circular disk having a flat horizontal upper surface. The plate 22 is provided with an inner circle of pin holes 25 and an outer circle of pin holes 26, there being twice the number of holes 26 as there are holes 25. The pin holes are uniformly spaced in the respective circles, and the inner holes 25 are staggered relative to the outer holes 26. Two diametrically opposite holes 25 are reenforced by bosses 27 which are welded to the plate 22 and extend downwardly therefrom. It will be understood that at assembly the pins 12 will extend through the holes 25, and the pins 14 will extend through the holes 26. The two bosses 27 will serve as guides to maintain proper alignment of the holes with the pins, particularly when the coil plate is raised to its uppermost position.

The annular area of the coil plate between the inner and outer circles of pin holes is subjected to a considerable heating effect from the coil of

hot metal which rests thereon when the reel is in use. In order to prevent damage to the plate from such localized heating thereof, narrow radial slots **29** of uniform width are provided, these slots extending inwardly from the outer edge of the coil plate and terminating in circular holes **30**. Each slot is located midway between two of the pin holes **25**, as well as midway between two of the pin holes **26**. Substantially radial ribs **31** are welded to the bottom of the plate **22** near the slots **29** and on opposite sides thereof, these ribs serving to stiffen and strengthen the plate without greatly adding to the weight thereof. At the outer end of each slot **29** and on opposite sides thereof there is provided a pair of bosses **33** and **34** (Fig. 3) having respectively holes **35** and **36** therethrough, each pair of holes being aligned in a direction extending substantially circumferentially of the coil plate. A pin **38** is mounted in each hole **35** and welded to the boss **33**, each pin extending through the adjacent hole **36**, which is slightly larger than the pin in order to permit a free sliding movement thereof. With this construction, the pins **38** will maintain proper alignment between the plate portions on opposite sides of the slots **29** without preventing expansion and growth caused by heating.

In manufacturing the coil plate, the hub **21**, ribs **31**, flange **23**, and bosses **33** and **34** are welded to the plate **22**, each pair of bosses **33** and **34** being preferably formed in an integral block. Thereupon the holes **30** are drilled and the slots **29** are sawed, these slots severing each boss **33** from the adjacent boss **34**. The holes **35** and **36** will now be drilled, and the pins **38** inserted therethrough and welded, whereupon the remaining machining operations will be performed including the finishing of the top surface of the plate. In this manner any internal strains which may be set up in the plate by reason of the welding thereof will be relieved when the slots are formed, and the pins **38** will be free from any initial loading.

It will now be apparent that the improved coil plate disclosed is comparatively light in weight and hence will not produce undesirable inertia effects. Although the plate is subjected to severe heating over an annular area while in service, this will cause no difficulties, since the slots **29** divide the plate into relatively small sections each of which is free to expand and grow independently. The ribs **31** and the flange **23** serve to stiffen and strengthen each plate section, and the pins **38** serve to maintain the plate sections in alignment while permitting relative movement of the parts in a circumferential direction.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A coil plate for a pouring reel comprising a disk having holes therethrough arranged in inner and outer concentric circles, and a plurality of slots extending inwardly from the outer margin of the disk and between the holes.

2. A coil plate for a pouring reel comprising a disk having holes therethrough arranged in inner and outer concentric circles, there being twice the number of holes in the outer circle as in the inner circle, the holes being uniformly spaced in the respective circles, and the holes in the inner circle being staggered relative to the holes in the outer circle, and a plurality of substantially radial slots extending inwardly from the outer margin of the disk and located between the holes.

3. A coil plate for a pouring reel comprising a disk having a plurality of slots extending inwardly from the outer margin thereof, and means adjacent the outer ends of the slots to maintain the disk portions on opposite sides of the slots in substantial alignment without preventing relative circumferential movement of said portions.

4. A coil plate for a pouring reel comprising a disk having a plurality of slots extending inwardly from the outer margin thereof, a pair of bosses on opposite sides of each slot near the outer end thereof, and a pin rigidly secured to one boss of each pair and extending in a generally circumferential direction into an opening in the other boss, the openings slidably receiving the pins to maintain the disk portions on opposite sides of the slots in substantial alignment without preventing relative circumferential movement of said portions.

5. A coil plate for a pouring reel comprising a disk having holes therethrough arranged in a circle concentric with the disk, and a plurality of slots extending inwardly from the outer margin of the disk and between the holes.

6. A coil plate for a pouring reel comprising a disk having holes therethrough arranged in a circle concentric with the disk, a plurality of slots extending inwardly from the outer margin of the disk and between the holes, and ribs on the disk located near the slots and extending in the same general directions as the adjacent slots.

MYLES MORGAN.