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Guide rail for crawler track

Abstract

A replaceable guide rail for a crawler includes a base that has a flange. The replaceable guide rail further includes a hole extending laterally through the flange that is configured to receive a fastener to secure a portion of the crawler to the flange, a guide member extending along the centerline and being configured to contact a track portion of the crawler and be worn down during movement of the track portion over the guide member, and a wear indicator positioned in the guide member configured to indicate whether the guide rail is in condition for replacement. The guide member has a thickness that is reduced as the guide member is worn down. The wear indicator is covered while the thickness is in a first range of thickness, and the wear indicator is exposed while the thickness is in a second range of thickness.

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Background/Summary

CROSS-REFERENCE TO RELATED APPLICATIONS (1) This application claims the benefit of U.S. Provisional Patent Application No. 63/137,059, filed Jan. 13, 2021, the entire content of which is incorporated herein by reference.

FIELD
(1) The present disclosure relates to industrial machines and, more particularly, to a guide rail for a crawler of a mining machine.
(2) Conventional earth-moving machines, such as mining shovels and excavators, include crawler

mechanisms for moving the machine over the ground. The crawler mechanism includes an articulated track composed of multiple links or shoes coupled together to form a continuous loop. The shoes engage the ground and engage a row of rollers along a roller path as the track is driven. The weight of the machine and any loads supported by the machine are transmitted through the rollers to the shoes, thereby causing the shoes to wear down and/or deform over time.

SUMMARY

(3) In one independent aspect, replaceable guide rail for a crawler including a frame and a track drivable around the frame includes a base elongated along a centerline, the base configured to be removably coupled to the frame; a wearable portion supported by the base and having an outer surface configured to be in contact with the track, the wearable portion having a first thickness at an initial stage of operation and a second thickness at a second stage of operation, the second thickness being less than the first thickness; and a wear indicator positioned in the wearable portion, the wear indicator being covered while the wearable portion has the first thickness, the wear indicator being exposed while the wearable portion has the second thickness.

(4) In another independent aspect, a crawler assembly for an earthmoving machine includes a plurality of shoes coupled together to form a continuous track, the track being configured to be driven around a perimeter of a crawler frame; a replaceable guide rail configured to be removably coupled to the frame, the guide rail including a surface contacting the shoes as the track is driven around the perimeter of the frame, the surface including a material that wears away as the shoes contact the surface; and a wear indicator positioned on a portion of the guide rail, the wear indicator being exposed through the outer surface of the guide rail as the shoes contact the guide rail

(5) In another independent aspect, a replaceable guide rail for a crawler of an earthmoving machine includes a base elongated along a centerline, the base including a flange; a hole extending laterally through the flange, the hole being configured to receive a fastener to secure a portion of the crawler to the flange; a guide member extending along the centerline and being configured to contact a track portion of the crawler and be worn down during movement of the track portion over the guide member, the guide member having a thickness that is reduced as the guide member is worn down; and a wear indicator positioned in the guide member configured to indicate whether the guide rail is in condition for replacement, the wear indicator being covered while the thickness is in a first range of thickness, and the wear indicator being exposed while the thickness is in a second range of thickness.

(6) Other independent aspects will become apparent by consideration of the detailed description and accompanying drawings.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

(1) FIG. **1** is a perspective view of a mining shovel.

(2) FIG. **2** is a perspective view of a crawler.

(3) FIG. **3** is a side view of a portion of the crawler of FIG. **2**.

(4) FIG. **4** is a perspective view of a shoe.

(5) FIG. **5** is a perspective view of a portion of a track frame including a guide rail assembly.

(6) FIG. **6** is a perspective view of a guide rail.

(7) FIG. **7** is a section view of the guide rail of FIG. **6** viewed along section **7**-**7**.

(8) FIG. **8** is a section view of the guide rail of FIG. **6** viewed along section **8**-**8**.

(9) FIG. **9**A is another perspective view of the guide rail of FIG. **6**, illustrating an initial condition of the guide rail with a plurality of openings not exposed.

(10) FIG. **9**B is a section view of the guide rail of FIG. **9**B viewed along section **9**B-**9**B.

(11) FIG. **10**A is a perspective view of the guide rail of FIG. **6**, illustrating a final condition of the guide rail with a plurality of openings exposed.
(12) FIG. **10**B is a section view of the guide rail of FIG. **10**A viewed along section **10**B **10**B.
(13) FIG. **11** is a perspective view of a guide rail according to another embodiment.
(14) FIG. **12** is a perspective view of a guide rail according to another embodiment.
(15) FIG. **13** is a perspective view of a guide rail according to another embodiment.
(16) FIG. **14** is a perspective view of a guide rail according to another embodiment.
(17) FIG. **15** is a section view of a guide rail according to another embodiment.
(18) FIG. **16** is a section view of a guide rail according to another embodiment.
(19) FIG. **17** is a perspective view of a guide rail according to another embodiment.
(20) FIG. **18** is a section view of the guide rail of FIG. **17** viewed along section **18**-**18**.
(21) FIG. **19** is a perspective view of a guide rail according to another embodiment.
(22) FIG. **20** is a section view of the guide rail of FIG. **19** viewed along section **20**-**20**.
(23) Before any independent embodiments are explained in detail, it is to be understood that the disclosure is not limited in its application to the details of construction and the arrangement of components set forth in the following description or illustrated in the following drawings. The disclosure is capable of other independent embodiments and of being practiced or of being carried out in various ways. Also, it is to be understood that the phraseology and terminology used herein is for the purpose of description and should not be regarded as limiting. Use of “including” and “comprising” and variations thereof as used herein is meant to encompass the items listed thereafter and equivalents thereof as well as additional items. Use of “consisting of” and variations thereof as used herein is meant to encompass only the items listed thereafter and equivalents thereof. Unless specified or limited otherwise, the terms “mounted,” “connected,” “supported,” and “coupled” and variations thereof are used broadly and encompass both direct and indirect mountings, connections, supports, and couplings.

DETAILED DESCRIPTION

(24) FIG. **1** illustrates an earthmoving machine, such as a mining shovel **10**, including a frame **14** supporting a boom **26**, an elongated member or stick or handle **30**, and an attachment or dipper **34** coupled to the handle **30**. The frame **14** includes an upper portion **16** that is supported by an undercarriage **18** having crawlers **22**. The upper portion **16** supports a hoist drum (not shown) for reeling in and paying out a cable or hoist rope **42**. The boom **26** includes a first end **46** coupled to the upper portion **16** of the frame **14** and a second end **50** opposite the first end **46**, and a boom sheave **54** is coupled to the second end **50** of the boom **26** and guides the rope **42** over the second end **50**. In the illustrated embodiment, the shovel includes a saddle block **58** rotatably coupled to the boom **26** by a shipper shaft **62**, which is positioned between the first end **46** and the second end **50** of the boom **26**. The shipper shaft **62** extends through the boom **26** in a direction that is transverse to a longitudinal axis of the boom **26**. The hoist rope **42** is coupled to the dipper **34** by a bail **66**, and the dipper **34** is raised or lowered as the hoist rope **42** is reeled in or paid out, respectively, by the hoist drum.
(25) The handle **30** includes a first end **82** and a second end **86**. In the illustrated embodiment, the second end **86** is movably received in the saddle block **58**, and the handle **30** passes through the saddle block **58** such that the handle **30** is capable of rotational and translational movement relative to the boom **26**. The saddle block **58** is rotatable relative to the boom **26** about the shipper shaft **62**, and the handle **30** rotates relative to the boom **26** while the handle **30** remains in the saddle block **58**.
(26) As shown in FIGS. **2** and **3**, each crawler **22** includes a track frame **90** and a track **92** including links or shoes **94** coupled together to form an articulated, continuous loop. The track frame **90** includes a first end **98**, a second end **102**, a first or lower portion **106**, and a second or upper portion **110**. In the illustrated embodiment, a driving member **114**, such as a first sprocket **114** (FIG. **2**), is supported for rotation at the first end **98**, and a second driving member **118** (e.g.,

second sprocket **118**; FIG. **3**) is supported for rotation at the second end **102** of the frame **90**. At least one of the sprockets **114**, **118** may be driven by a motor (not shown). The sprockets **114**, **118** engage the crawler shoes **94** (e.g., by teeth extending into spaces between the shoes **94**), thereby driving the shoes **94** around the perimeter of the track frame **90** in a continuous loop. The track **92** defines a first or lower run proximate the ground and a second or upper run extending along the upper portion **110** of the frame **90**. As the shoes **94** move along the lower run, the shoes **94** engage the ground to move the machine **10** with respect to the ground.

(27) As shown in FIG. **3**, rollers **126** are rotatably coupled to the lower side **106** of the frame **90**. In the illustrated embodiment, the rollers **126** are aligned with one another such that all of the rollers **126** rotate in a common plane. Stated another way, the rollers **126** are aligned along a direction of travel of the shoes **94**. As shown in FIG. **4**, each shoe **94** includes a first end **130**, a second end **134**, and an intermediate portion **138** positioned between the first end **130** and the second end **134**. The shoes **94** are driven in a direction that is generally perpendicular to a line drawn between the first end **130** and the second end **134**. The intermediate portion **138** includes a wear surface or roller path area **142**. In the illustrated embodiment, the shoes **94** include sprocket engagement portions engaging the sprockets **114**, **118**, which drive the shoes **94** around the frame **90**.

(28) FIG. **5** illustrates a guide rail assembly **150** extending along an upper portion **110** of the track frame **90**. In the illustrated embodiment, the guide rail assembly **150** includes multiple rails **154** (e.g., four rails), each having an elongated shape and aligned parallel to the direction of travel of the shoes **94**. Stated another way, the rails **154** are aligned in an end-to-end configuration such that all of the rails **154** extend along a common plane. Each rail **154** is independently coupled to the upper portion **110** of the track frame **90** (e.g., by a bolted connection), and each rail **154** can be removed and replaced without requiring disassembly of any adjacent rails **154**. In other embodiments, the track frame **90** may include fewer or more rails, the rails may be oriented in a different manner, and/or the rails may be coupled to the track frame **90** in a different manner.

(29) As the shoes **94** are driven around the track frame **90**, the wear surface **142** of the shoe **94** moves along the guide rail **154** while in a vicinity of the upper portion **110** of the track frame **90** and contacts the rollers **126** in a vicinity of the lower side **106**. Each time the wear surface **142** of the shoe **94** contacts the guide rail **154**, a portion of the guide rail **154** wears at least slightly.

(30) Referring now to FIGS. **6**-**10**B, each guide rail **154** includes a base **162** for coupling to the frame **90** (FIG. **4**), and a guide member **164**. The guide member **164** includes an outer surface **166** for engaging the shoes **94** as they move around the frame **90**, and the guide member **164** extends along a centerline **170** (FIGS. **9**A-**10**B). In the illustrated embodiment, the base **162** includes a pair of flanges **174** oriented parallel to one another and parallel to the centerline **170**, and a central portion or web **178** extends between the flanges **174**. Openings or holes **182** extend laterally through the flanges **174**, and are configured to receive a fastener (e.g., a bolt) to secure a portion of the track frame **90** between the flanges **174**. In other embodiments, the base may be constructed in a different manner.

(31) The guide member **164** includes a first end **186** and a second end **190** opposite the first end **186**, and the centerline **170** extends between the first end **186** and the second end **190**. Side portions or wings **194** extend between the first end **186** and the second end **190** and are positioned laterally outward from the centerline **170**. In the illustrated embodiment, the ends **186**, **190** of the guide member **164** are angled toward the frame **90**.

(32) The guide member **164** also includes a wear indicator portion **198**. As best shown in FIG. **9**B, the wear indicator portion **198** may include a portion having a thickness that is less than a thickness of the adjacent portion of the guide member **164**. In the illustrated embodiment, the wear indicator portion **198** includes a recess formed on a lower surface of the guide member **164**, opposite the outer surface **166**. The wear indicator portion **198** is positioned on the wing **194**, between a lateral edge of the guide member **164** and the associated flange **174**, and between the ends **186**, **190** and the central portion of the base **162**.

(33) As shown in FIGS. **9**A and **9**B, the guide member **164** has an initial wearable thickness T. In the illustrated embodiment, the outer surface **166** has an initial condition in which the outer surface **166** has an initial radius of curvature R**1** with and initial arclength. In the illustrated embodiment, the initial arclength can be defined by an amount of material that forms the outer surface **166**. As the guide member **164** wears, the thickness is reduced from the initial thickness T, and the outer surface **166** approaches a final condition in which the outer surface **166** has a radius that is different from the initial radius R**1**. Once the thickness of the guide member **164** wears to a predetermined level, as defined below, the outer surface **166** has a final arclength and a final radius of curvature R**2**. In the illustrated embodiment, the final arclength is less than the initial arclength or substantially similar to the initial arclength. The initial radius R**1** and the final radius R**2** may be substantially similar when measured from offset center points (e.g., offset by an amount the thickness T wears). In the illustrated embodiment, outer surface **166** has an arched profile at an initial stage, and has a flatter (e.g., less arched) profile at a later stage as the thickness T is reduced.
(34) For example, as the shoes **94** are driven around the track frame **90** against the outer surface **166** of the guide member **164**, the material thickness is reduced from the initial thickness T and the radius is increased from the initial radius R**1** (e.g., due to a curved overall cross-section of the guide member **164**). In some embodiments, the outer surface **166** may have little to no curvature such that the initial arclength and final arclength remain substantially similar as the initial thickness T is decreased; in other embodiments, the final arclength may be less than the initial arclength.
(35) When the outer surface **166** has worn to a predetermined level, such as an end-of-life or alert level, one or more of the wear indicator portions **198** will create a visible opening or window **196** (FIGS. **10**A and **10**B) extending through the guide member **164**. In the illustrated embodiment, the window **196** is elongated. A lip **195** may be formed on the guide member **164** and positioned between the wear indicator portion **198** and an outer surface of the wing **194**. In some instances along the centerline **170**, the lip **195** may be situated between a portion of the window **196** and the outer surface of the wing **194**.
(36) FIGS. **10**A and **10**B illustrate a guide member **164** that has worn beyond the predetermined level (e.g., to an end-of-life level) to expose the elongated window **196** in each of the wear indicator portions **198**. In the illustrated embodiment of FIGS. **10**A and **10**B, the guide member includes four discrete windows **196** generally positioned in four corners of the guide member **164** and/or in four separated regions, such as four indicator portions **198**. As illustrated in FIG. **9**B, the initial thickness T is defined from the outer surface **166** to the window **196**. Thus, the window **196** may have a material thickness of zero such that the window **196** can be an opening, void, and/or the like. However, to maintain some strength in the guide member **164**, the lip **195** may be present, and the lip **195** may have thickness.
(37) In practice, less than all of the windows **196** may become exposed at one time. While FIGS. **10**A and **10**B illustrate a guide member **164** that has worn evenly (e.g., uniformly, with equal amounts of reduction in thickness or arclength, etc.) to expose each window **196** by a similar amount, the guide member **164** could experience wear in different regions and by different amounts such that non-uniform wear occurs. For example, the guide member **164** could wear by a greater amount at the first end **186** than at the second end **190**, thereby exposing the window or windows **196** adjacent the first end **186** before exposing the window or windows **196** adjacent the second end **190**. The presence of one or more windows **196** provides a clear and effective visual indicator that a guide rail **154** (or at least a guide member **164**) needs replacement. The wear indicators **198** may also permit inspection of the guide member **164** while the crawler is assembled to the machine (i.e., without requiring significant disassembly).
(38) As stated above, the guide members **164** wear over time as the shoes **94** (FIG. **4**) contact the outer surface **166**. A user may inspect the track **92** (FIG. **2**) for the presence of windows **196** visible beneath the shoes **94**. In one instance, a user could shine a light on the track **92** from above or below the shoes **94**. If light can be seen by the user, for example, shining through a window **196** in

one of the guide members **164** or on an opposing side or edge of the shoe **94**, then the presence of such light can indicate to the user that at least one of the guide member **164** and the shoe **94** needs replacing and/or maintenance. In one specific example, a user standing next to the crawler below the guide member **164** could look upwardly toward the bottom of the guide rail **154**. If light (e.g., daylight) is visible through the guide rail **154** as the shoves **94** pass over the guide rail **154**, the guide rail **154** may require replacement.

(39) In other embodiments (FIGS. **11-20**), the wear indicator portions **198** can be formed in a different manner. The guide members **164** and features thereof described in FIGS. **11-20** are identified with like reference numbers. The wear indicator portions or "wear indicators" are identified with similar reference numbers as wear indicator portions **198** of FIGS. **1-10**, plus **100**. It should be stated that, while each embodiment of a guide member **164** discussed herein is illustrated as including one embodiment of the wear indicator portion(s) **198**, each guide member **164** could include more than one type of wear indicator portion **198** described herein. The guide member **164** is not limited to including only a single type of wear indicator portion, nor are the wear indicator portions limited in discrete parts of the guide member **164**, such that different wear indicator portion could be provided in a common part or region of a single guide member **164**. Further, it should be understood that multiple guide rails **154** with guide members **164** can be coupled to the track frame **90** in a series or row. Adjacent guide rails **154** can include different wear indicator portions **198**. Adjacent guide rails **154** on the track could also include no wear indicator portion **198** such that only a single guide rail **154** in a series includes wear indicators **198**. In other words, different embodiments of wear indicator portion **198** may be incorporated in various combinations throughout the series of guide rails **154** on the track frame **90**.

(40) As illustrated in FIGS. **11** and **12**, each wear indicator **298**, **398** may include small recesses and may be positioned along lateral portions of the lower surface of the guide member **164** (FIGS. **11** and **12**). As further illustrated in FIGS. **11** and **12**, the guide member **164** could include multiple wear indicators **298**, **398** in different regions of the guide member **164**.

(41) In the embodiment illustrated in FIG. **11**, the guide member **164** includes more than two wear indicators **298**, such as six generally circular wear indicators **298**, on each side of the guide member **164**. The wear indicators **298** have a circular shape or cross-section. The wear indicators **298** could also be dome shaped and have a base extending from the bottom surface of the guide member **164**.

(42) As illustrated in FIG. **12**, some embodiments of the guide member **164** include four elliptical or slightly oblong wear indicators **398** on each side of the guide member **164**. The wear indicators **398** could also be slotted.

(43) In the embodiment illustrated in FIG. **13**, each wear indicator portion **498** may include elongated recesses that are integrated with the vertical surface of the flanges **174** (FIG. **13**). Such embodiments may include more than one wear indicator portion **498** on each side of the guide member **164**. As further illustrated in FIG. **13**, each of the wear indicators **498** is sloped or chamfered with a surface of the flanges **174**. In the illustrated embodiment, the wear indicator **498** is positioned adjacent the holes **182** extending laterally through the flanges **174**. The sloped parts of the wear indicators **498** may provide additional space for the fastener (e.g., bolt) received in the holes **182** for securing the guide rail **154** to a portion of the track frame **90** (FIG. **5**).

(44) In other embodiments, such as in the embodiment illustrated in FIG. **14**, each wear indicator portion **598** may include an elongated pocket having multiple raised sections (FIG. **14**), although a pocket having a single raised section (FIG. **6**) may avoid restricting directional solidification during manufacture. In addition, the wear indicator portions **598** permit an operator to inspect the guide member **164** while the crawler is assembled on the machine. The wear indicator **598** allows for viewing of the wear indicator **598** from a side of the guide member **164** even when the wear indicator **598** is not viewable from above the guide member **164**.

(45) As shown in FIG. **15**, in other embodiments, the wear indicator portion **698** may include and/or be formed as a runner or groove **202** positioned on a lateral edge of each wing **194** and

extending between the first end **186** and the second end **190** (FIG. **14**). The groove **202** may permit an operator to easily inspect the guide member **164** from the side while the crawler is assembled on the machine, and to gauge the remaining working life of the guide member **164** (i.e., by evaluating the distance between the outer surface **166** and the groove **202**). For example, if the operator views the wear indicator **698** and sees that half of the groove **202** is visible/remains, then the operator can assume that at least a portion of the guide member **164** has begun to wear.

(46) As shown in FIG. **16**, in some embodiments, the wear indicator portion **798** may be formed as an angled recess in the lower surface of the guide member **164**. The recess has a root **206** positioned closest to the outer surface **166**. As the guide member **164** wears, a narrowest portion of the recess will become exposed initially as a narrow window. The window will gradually become larger as the guide member **164** wears further (e.g., as the thickness of the outer surface **166** wears). The window may be designed to become visible at an early stage (e.g., adjacent the root **206**) to allow an operator to plan for replacement. For example, a large amount of visible wear indicator **798** widow may indicate that the guide rail **154** should be replaced.

(47) FIGS. **17** and **18** illustrate a guide member **164** in which the wear indicator **898** is formed as a plurality of through-holes extending through the guide member **164** from the outer surface **166** to a lower surface. The through-holes permit an operator to accurately and consistently measure thickness at any time and plan for replacements without requiring the track to be removed from the rail. As shown best in FIG. **18**, a depth of the wear indicator **898** becomes more shallow as the thickness of the guide member **164** is reduced.

(48) FIGS. **19** and **20** illustrate a guide member **164** in which the wear indicator portions **998** include recesses formed on a lower surface of the guide member **164** between flanges **174**, and aligned along a centerline **170** of the guide member **164**. As the guide member **164** wears, openings or windows of the wear indicator **998** will appear along the centerline **170** of the guide rail. The wear indicator **998** further includes a root portion **210**. The root portion **210** is generally curved or domed. The wear indicator **998** begins to show once the root portion **210** becomes visible from above the guide member **164**. As best illustrated in FIG. **20**, the root portion **210** will begin to be visible as a dot, small circle, and/or the like, and gradually increase in diameter as more of the wear indicator **998** becomes visible. Once the root portion **210** is no longer visible/depleted, an opening (e.g., void, recess, etc.) diameter/cross-section of the wear indicator **998** will begin to increase more rapidly. In other words, on opening present in the root portion **210** increases more gradually and indicates that the guide member **164** has begun to wear. In some embodiments, the more rapid increase corresponds to a warning zone for the operator to know that the guide member **164** has begun wearing in a critical zone. The gradual increase may alert the operator that the guide rail **154** will need to be replaced soon.

(49) The embodiment(s) described above and illustrated in the figures are presented by way of example only and are not intended as a limitation upon the concepts and principles of the present disclosure. As such, it will be appreciated that variations and modifications to the elements and their configuration and/or arrangement exist within the spirit and scope of one or more independent aspects as described.

Claims

1. A replaceable guide rail for a crawler including a frame and a track drivable around the frame, the guide rail comprising: a base elongated along a centerline, the base configured to be removably coupled to the frame; a wearable portion supported by the base and having an outer surface configured to be in contact with the track, the wearable portion having a first thickness at an initial stage of operation and a second thickness at a second stage of operation, the second thickness being less than the first thickness, the wearable portion including a lateral edge; and a wear indicator positioned in the wearable portion between a centerline of the wearable portion and the lateral

edge, the wear indicator being covered while the wearable portion has the first thickness, the wear indicator being exposed as an opening extending through the outer surface while the wearable portion has the second thickness.
2. The guide rail of claim 1, wherein a portion of the wear indicator is positioned beneath the wearable portion during the initial stage of operation.
3. The guide rail of claim 2, wherein the wear indicator is visible from above the guide rail while the wearable portion has the second thickness.
4. The guide rail of claim 3, wherein, during the second stage of operation, the wear indicator provides a window through which the track can be viewed from below the guide rail.
5. The guide rail of claim 3, wherein the opening is elongated in a direction parallel to the centerline.
6. The guide rail of claim 1, wherein the first thickness of the wearable portion is defined between the outer surface and the wear indicator during the initial stage of operation.
7. The guide rail of claim 6, wherein the outer surface is arched across the centerline and has a first radius of curvature while the wearable portion has the first thickness, wherein the radius of curvature when the wearable portion has the second thickness is the same or greater than the first radius of curvature.
8. The guide rail of claim 7, wherein the base is arched across the centerline, and further comprising a lip positioned adjacent the lateral edge, the wear indicator being positioned between the lip and the centerline.
9. The guide rail of claim 8, wherein the wear indicator includes a first indicator portion positioned at a first end of the centerline and second indicator portion positioned at a second end of the centerline.
10. The guide rail of claim 1, wherein the wear indicator portion includes a first pair of openings, each of the openings of the first pair of openings positioned on opposite first and second sides of the centerline proximate a first end of the wearable portion, and further including a second pair of openings, each of the openings of the second pair of openings positioned on the opposite first and second sides of the centerline proximate a second end of the wearable portion.
11. A crawler assembly for an earthmoving machine, the crawler assembly comprising: a plurality of shoes coupled together to form a continuous track, the track being configured to be driven around a perimeter of a crawler frame; a replaceable guide rail configured to be removably coupled to the frame, the guide rail including a surface contacting the shoes as the track is driven around the perimeter of the frame, the surface including a material that wears away as the shoes contact the surface; and a wear indicator positioned on the guide rail between a centerline of the guide rail and a lateral edge of the guide rail, the wear indicator being exposed as an opening extending through the outer surface of the guide rail as the shoes contact the guide rail.
12. The crawler assembly of claim 11, wherein the replaceable guide rail is a first guide rail in a plurality of replaceable guide rails each elongated along a centerline and configured to be coupled to the frame, and wherein the plurality of guide rails is configured to be coupled to the frame in a sequence with the centerline of at least one guide rail aligned with at least two shoes coupled together.
13. The crawler assembly of claim 12, wherein the first guide rail is positioned end-to-end with a second replaceable guide rail in a direction of travel of the plurality of shoes.
14. The crawler assembly of claim 11, wherein the surface of the guide rail that contacts the shoes is arched laterally across the centerline and has a radius of curvature while the material has a first thickness, wherein as the material wears, the radius of curvature remains the same or increases.
15. The crawler assembly of claim 14, wherein the material has a thickness defined between the surface and the wear indicator, and wherein the thickness decreases as the material wears away to expose the wear indicator.
16. The crawler assembly of claim 11, wherein the wear indicator is a first wear indicator of a

plurality of wear indicators each positioned in at least one of four different wear indicator regions, at least two wear indicator regions being positioned on opposite sides of the centerline of the guide rail, and at least two wear indicator regions being positioned on opposite ends of the centerline.

17. The crawler assembly of claim 16, wherein each of the plurality of wear indicators provides a window that visibly exposes the track when viewed from below the replaceable guide rail.

18. A replaceable guide rail for a crawler of an earthmoving machine, the guide rail comprising: a base elongated along a centerline, the base including a flange; a hole extending laterally through the flange, the hole being configured to receive a fastener to secure a portion of the crawler to the flange; a guide member extending along the centerline and being configured to contact a track portion of the crawler and be worn down during movement of the track portion over the guide member, the guide member having a thickness that is reduced as the guide member is worn down; and a wear indicator positioned in the guide member between the centerline and the lateral edge of the guide member, the wear indicator configured to indicate whether the guide rail is in condition for replacement, the wear indicator being covered while the thickness is in a first range of thickness, and the wear indicator being exposed as an elongated opening extending through an outer surface while the thickness is in a second range of thickness.

19. The replaceable guide rail of claim 18, wherein the wear indicator is at least partially positioned in the base such that the first range of thickness extends from an outer surface of the guide member to the base and the second range of thickness extends from within the guide member to within the base.

20. The replaceable guide rail of claim 18, wherein a greater portion of the wear indicator becomes exposed as the thickness decreases.