

The inventors hereof have found that with the weld materials commercially available, that no structural integrity has been lost by placing the slots **36** in the weld **44**. Most importantly, the inventors have enabled the overall length of the drill bit **30** to be significantly reduced in comparison to comparable Prior Art drill bits. For example, as stated above, in a standard 6½ inch diameter PDC drill bit, the distance from the lowermost tip of the crown to a location on the shank immediately beyond the slots, can be about 8 inches to about 8¾ inches, with the distance between the intersection and the center of the slots being about 3 inches. With the present invention, this 3 inch distance can be removed so that when the slots **36** are located at the intersection **38** the distance from the lowermost tip of the crown **32** to a location on the shank **34** immediately beyond the slots **36**, can be about 5 inches to about 5¾ inches.

This reduction of about 3 inches from the overall length of the drill bit does not at first appear to be significant, but those skilled in the art realize that any shortening of the overall length of the drill bit can dramatically increase the ease that such a drill bit can be steered while drilling.

Whereas the present invention has been described in particular relation to the drawings attached hereto, it should be understood that other and further modifications, apart from those shown or suggested herein, may be made within the scope and spirit of the present invention.

What is claimed is:

1. A rotary drill bit for drilling subsurface formations, comprising:

a bit body having a crown portion and a shank portion, extending from the crown portion, for connection to a drill string; and

breaker slots in the bit body formed at the intersection of the crown portion and the shank portion.

2. A rotary drill bit of claim 1 wherein the crown portion and the shank portion are joined by a weld, with the breaker slots formed substantially in the weld.

3. A rotary drill bit of claim 2 wherein an upper portion of the crown portion has a beveled surface adjoining a beveled surface in a lower portion of the shank portion, with the weld filling a space between the two adjoining beveled surfaces.

4. A rotary drill of claim 1 wherein the drill bit is a drag-type drill bit.

5. A rotary drill bit for drilling subsurface formations, the drill bit comprising:

a bit body having a crown portion and a shank portion, the shank portion extending from the crown portion for connection to a drill string, the crown portion and the shank portion being joined together at an intersection by a weld; and

breaker slots in the bit body formed substantially in the weld at the intersection of the crown portion and the shank portion, wherein an upper portion of the crown portion has a beveled surface adjoining a beveled surface in a lower portion of the shank portion, with an inclusive angle between the adjoining beveled surfaces being about 40 degrees.

6. A drag-type rotary drill bit for drilling subsurface formations, comprising:

a bit body having a shank portion for connection to a drill string, and a crown portion; and

breaker slots in the bit body formed at or immediately adjacent to the intersection of the crown portion and the shank portion.

7. A rotary drill bit of claim 6 wherein the crown portion and the shank portion are joined by a weld, with the breaker slots formed substantially in the weld.

8. A rotary drill bit of claim 7 wherein an upper portion of the crown portion has a beveled surface adjoining a beveled surface in a lower portion of the shank portion, with the weld filling a space between the two adjoining beveled surfaces.

9. A rotary drill bit of claim 6 wherein the crown portion is formed from a metallic matrix material and the shank portion is formed from a ferrous material.

10. A drag-type rotary drill bit for drilling subsurface formations, the drill bit comprising:

a bit body having a shank portion for connection to a drill string, and a crown portion, the crown portion and the shank portion being joined at an intersection by a weld; and

breaker slots in the bit body formed at or immediately adjacent to the intersection of the crown portion and the shank portion, wherein an upper portion of the crown portion has a beveled surface adjoining a beveled surface in a lower portion of the shank portion, with an inclusive angle between the adjoining beveled surfaces being about 40 degrees.

11. A rotary drill bit for drilling in subterranean formations, the drill bit comprising:

a bit body having a shank portion and a crown portion, the shank portion being coupled to the crown portion by a weld; and

breaker slots formed in the weld.

12. The drill bit, as set forth in claim 11, wherein the rotary drill bit is a directional drill bit.

13. The drill bit, as set forth in claim 11, wherein bit body has a diameter of about 6.5 inches and a length of no more than about 5.75 inches as measured from a lowermost tip of the crown portion to a location on the shank portion immediately beyond the breaker slots.

14. A rotary drill bit for drilling in subterranean formations, the drill bit comprising:

a bit body having a shank portion and a crown portion, the shank portion being coupled to the crown portion at a junction; and breaker slots formed in the bit body at the junction.

15. The drill bit, as set forth in claim 14, wherein the rotary drill bit is a directional drill bit.

16. The drill bit, as set forth in claim 14, wherein bit body has a diameter of about 6.5 inches and a length of no more than about 5.75 inches as measured from a lowermost tip of the crown portion to a location on the shank portion immediately beyond the breaker slots.

17. A rotary drill bit for drilling in subterranean formations, the drill bit comprising:

a bit body having a shank portion and a crown portion, the shank portion being coupled to the crown portion by a weld; and

a plurality of breaker slots formed about the bit body, at least one of the breaker slots being formed in at least a portion of the weld.

18. The drill bit, as set forth in claim 17, wherein the rotary drill bit is a directional drill bit.

19. The drill bit, as set forth in claim 17, wherein bit body has a diameter of about 6.5 inches and a length of no more than about 5.75 inches as measured from a lowermost tip of the crown portion to a location on the shank portion immediately beyond the breaker slots.