

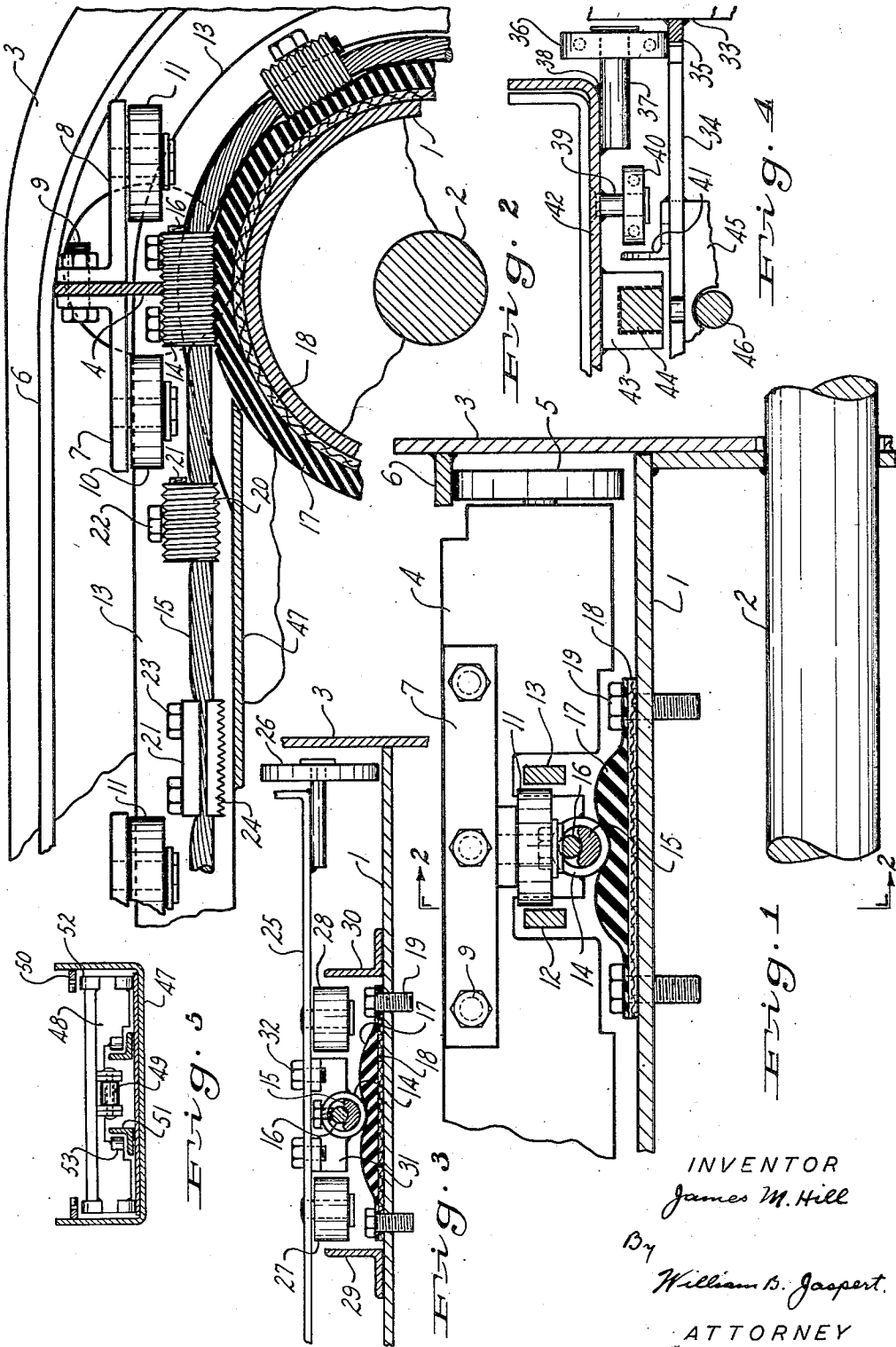
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MOBILE CURVABLE CONVEYORS

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MOBILE CURVABLE CONVEYORS

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7 Claims. (Cl. 198-203)

This invention relates to new and useful improvements in conveyor mechanism particularly for use in continuous mining machines, and the present application is a continuation-in-part of my now abandoned application Serial No. 399,705, filed December 22, 1953, and application Serial No. 451,133, filed August 20, 1954.

The last-named application discloses a mobile conveyor consisting of a plurality of wheel supported articulated frame sections for supporting the materials conveying means, which sections have a common flexible draw bar anchored to the end sections of the conveyor to maintain proper alignment of the sections when the conveyor is moved around curves in following a continuous mining machine.

The present invention more particularly deals with the materials conveying means supported on said articulated frame sections, and it is among the objects thereof to provide means for guiding the conveyor elements in their movement on the frame sections and to provide positively gripping traction means for engaging the conveying member.

It is a further object of the invention to provide simple anti-friction support and guide means which prevents rearward and forward angling of the movable conveying means while eliminating excessive friction and binding of the movable parts, which might interfere with the freedom of movement of the frame sections in traveling through a mine corridor.

It is still another object of the invention to employ a flexible wire rope to pull either the drag flights or the carrying pans for conveying the material, whichever may be employed, which rope is provided with gripping elements attached to the rope at intervals for engaging an impressionable surface of a drive pulley or drum to thereby eliminate tension on the rope that would interfere with the intended function of the flexible draw bar in guiding and maintaining proper alignment of the articulated frame sections.

The invention will become more apparent from a consideration of the accompanying drawing constituting a part hereof, in which like reference characters designate like parts, and in which—

Figure 1 is a vertical section, partially in elevation, of a fragmentary portion of a conveyor drive drum embodying the principles of this invention;

Figure 2 is a vertical section, partially in elevation, taken along the line 2—2 of Fig. 1;

Figure 3 is a vertical cross-sectional view of a fragmentary portion of a modified form of material conveying and drive means;

Figure 4 is a vertical section, partially in elevation, taken transversely of a conveyor frame section and pan conveying means; and

Figure 5 is a vertical cross-sectional view of a conveyor frame section and drag flight employing anti-friction blocks instead of guide wheels.

With reference to Figs. 1 and 2 of the drawing, the numeral 1 designates a drive drum mounted for rotation

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with a drive shaft 2. Drum 1 is disposed between side frames 3 for guiding a drag flight 4 having guide wheels 5 restrained by hold down flange 6.

The drag flights 4 are provided with angle brackets 7 and 8 secured by bolts 9 for carrying a pair of guide rollers 10 and 11 that engage guide bars 12 and 13.

As shown in Fig. 2, the guide bars 12 and 13 are curved with the drum but are straight during the length of the conveyor frame sections and prevent rearward and forward angling or binding of the drag flights because of the tandem relationship of the pairs of rollers 10 and 11. Drag flights 4 are connected by threaded sleeves 14, which may be ordinary pipe nipples, to a flexible wire rope 15, which is interlocked with the nipples 14 by wedge pins 16, as shown in Fig. 1. The drum 1 is provided with an impressionable surface material 17, such as rubber, mounted on a strip 18 and fastened by bolts 19 to the drum 1. The impressionable surface material 17 affords a firm grip with the threads of the sleeves 14, as shown in Fig. 2.

In addition to the drag flight connectors 14, other gripping means such as the nipple 20, Fig. 2, or the clamping plates 21, Fig. 2, may be secured to the wire rope either by a wedge 21 and bolt 22, or by the clamping plates being fastened by the bolts 23 to crimp the flexible wire 15. One of the clamping plates, designated by the numeral 24, is provided with serrations on its under surface to grippingly engage the impressionable surface material 17 of the drum in the same manner as do the threaded nipples 14 and 20. The drag flights 4 are spaced on the wire rope 15 throughout the length of the endless conveying rope to drag coal from the mining machine through the channel-shape trough constituted by a plurality of frame sections, which are of substantially the shape of the drum shown in Fig. 2, except that instead of the shaft 2 that supports the drum, the frame sections are supported on ground wheels, such as is shown in my co-pending application.

In the form of the invention shown in Fig. 3, coal carrying pans 25 may be employed in place of the drag flights 4, such pans being provided with guide rollers 26 and center guide rollers 27 and 28 that are movable between angle bars 29 and 30. The drum face is provided with the impressionable rubber surfacing material 17 mounted in the same manner as that described in connection with Fig. 1 of the drawing. The conveyor pans 25 are provided with vertical plates 31 bolted to the under surface of the pans by bolts 32. The vertical plates 31 are fastened to threaded nipples 14 by welding in the same manner as the drag flights 4 of Fig. 2, and are connected to the wire rope 15 by wedges 16 in the same manner as in Fig. 2.

In Fig. 4 is shown a fragmentary portion of a frame section designated by the numeral 33, having transverse bracing bars 34 and guide bar 35, the latter supporting guide wheels 36 that are mounted on stud shafts 37 welded to the underside of the pan, as shown at 38. The pans are further provided with vertical stud shafts 39 having guide wheels 40 journaled thereon for engaging angle bars 41. The conveyor pans, designated by the numeral 42, are provided with lugs 43 that engage the lengths of an endless conveyor chain 44. The cross members of the frame sections 34 are further provided with vertical plates 45 extending over a flexible drawbar 46 that maintains alignment of adjacent frame sections throughout the length of the conveyor. All this is fully described in my co-pending application, serially numbered 451,133, referred to above.

In Fig. 5 is shown a conveyor frame section 47 supported on ground wheels, not shown, which frame section is of channel shape and cross section through which the mined coal is moved by drag flights 48 connected to

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an endless conveyor chain 49. The frame section is provided with hold down bars 50 and angle bars 51 for engaging anti-friction blocks 52 and 53 respectively. These anti-friction blocks may be made of bronze or other materials softer than steel to lend anti-friction quality for easy movement of the drag flights through the frame sections. The anti-friction blocks may be symmetrical in height and length and may be secured to the drag flight by welding, as shown.

It is evident from the foregoing description of the invention that the operative relation of the conveyor and support where the frame sections are yieldingly supported by a flexible draw bar, as described and claimed in my co-pending application, Serial No. 451,133, provides a substantially frictionless coal conveying means by the use of a light weight flexible wire rope with center guide rolls arranged in tandem to prevent angling of the drive flights due to tension on the rope. It is also evident that traction of a wire rope is obtainable by means of the invention, by regulated pressure contact of the drive lugs on the drum instead of solely by tension on the rope.

Although several embodiments of the invention have been herein illustrated and described, it will be evident to those skilled in the art that various modifications may be made in the details of construction without departing from the principles herein set forth.

I claim:

1. In a mobile conveyor, conveying means comprising an endless flexible wire rope, a drum for driving said rope having a surface of impressionable material, material moving means having threaded sleeves connected to said wire rope for grippingly engaging the impressionable material of said drum, said material moving means having anti-friction guide means, and vertical and horizontal guide bars for engaging said guide means, said guide bars extending from a tangent around the curve of said drum.

2. In a mobile conveyor, conveying means comprising an endless flexible wire rope, a drum for driving said rope having a surface of impressionable material, material moving means provided with angle brackets having an externally threaded sleeve connected to said wire rope the threaded surface grippingly engaging the impressionable material of said drum, said angle brackets having guide rollers arranged in tandem and guide bars for engaging said rollers, said guide bars extending from a tangent around the curve of said drive drum.

3. In a mobile conveyor, conveying means comprising an endless flexible wire rope, a drum for driving said rope having a surface of impressionable material, material moving means provided with angle brackets having an externally threaded sleeve connected to said wire rope, the threaded surface grippingly engaging the impressionable material of said drum, said angle brackets having guide rollers arranged in tandem and guide bars for engaging said rollers, said guide bars extending from a tangent around the curve of said drive drum, and said material moving means having additional guide rollers and guide bars for said rollers, said guide bars extending in

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a horizontal plane tangent to the curvature of the drum and around the curve of said drum.

4. In a mobile conveyor, conveying means comprising an endless flexible wire rope, a drum for driving said rope having a surface of impressionable material, material moving means provided with angle brackets having an externally threaded sleeve connected to said wire rope, the threaded surface grippingly engaging the impressionable material of said drum, said angle brackets having guide rollers with their axes vertically disposed and said material moving means having additional guide rollers with their axes in a horizontal plane and vertical and horizontal guide bars for said guide rolls, said bars extending in a horizontal plane tangent to the drive drum and around the curvature of said drum.

5. In a mobile conveyor, conveying means comprising an endless flexible wire rope, a drum for driving said rope having a surface of impressionable material, material moving means having gripping means with serrated surfaces for engaging the impressionable material of said drum and having anti-friction guide means and guide bars for controlling the vertical and transverse movement of the conveying means with guide bars extending around the curvature of the drive drum.

6. In a mobile conveyor, conveying means comprising an endless flexible wire rope, a drum for driving said rope having a surface of impressionable material, material moving means comprising drag flights having externally threaded sleeves connected to said wire rope for grippingly engaging the impressionable material of said drum and said drag flights having anti-friction rollers and guide bars for controlling the vertical and lateral travel of said rollers throughout the length of travel of the conveying means and around the drive drum.

7. In a mobile conveyor, conveying means comprising an endless flexible wire rope, a drum for driving said rope having a surface of impressionable material, material moving means comprising pans having externally threaded sleeves connected to said wire rope for grippingly engaging the impressionable material of said drum and said pans having anti-friction rollers and guide bars for controlling the vertical and lateral travel of said rollers throughout the length of travel of the conveying means and around the drive drum.

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