Sept. 2, 1952 F. J. LAHAIE 2,608,840

KNUCKLE JOINT FOR TIE BORING MACHINES

Filed May 29, 1948 2 SHEETS—SHEET 1

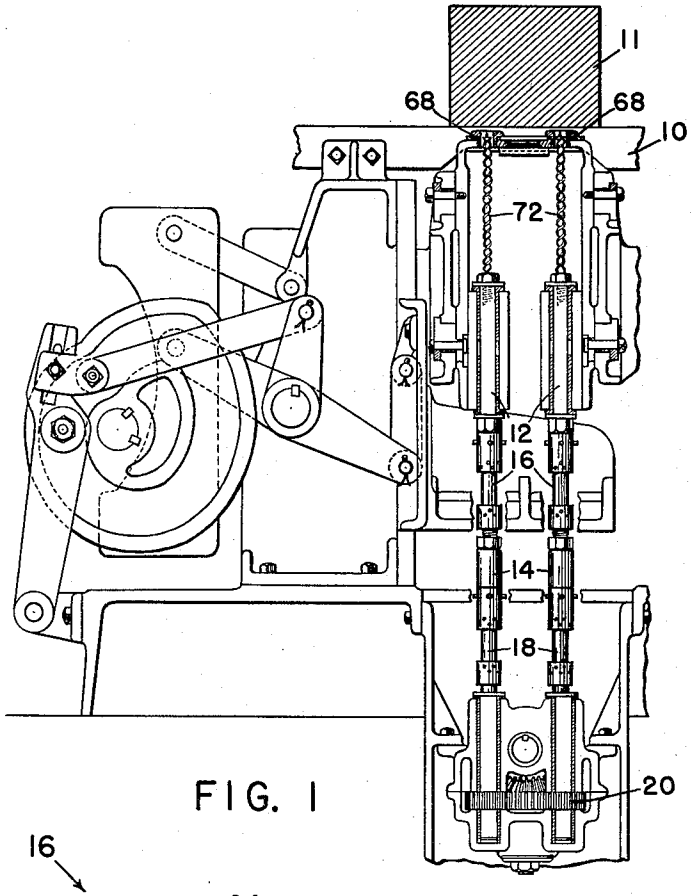


FIG. 1

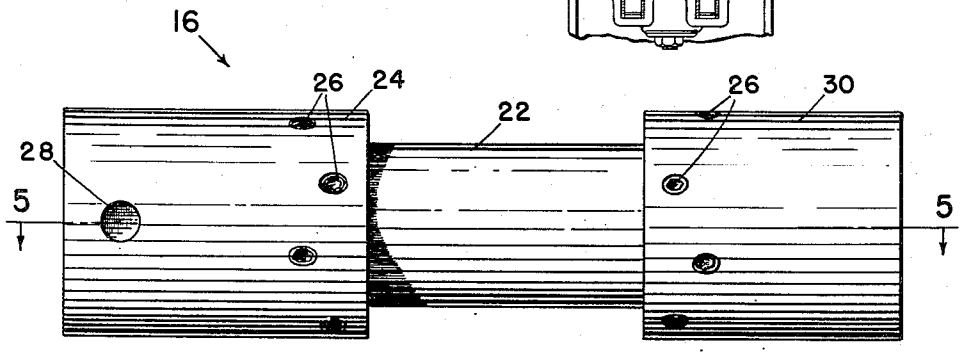


FIG. 2

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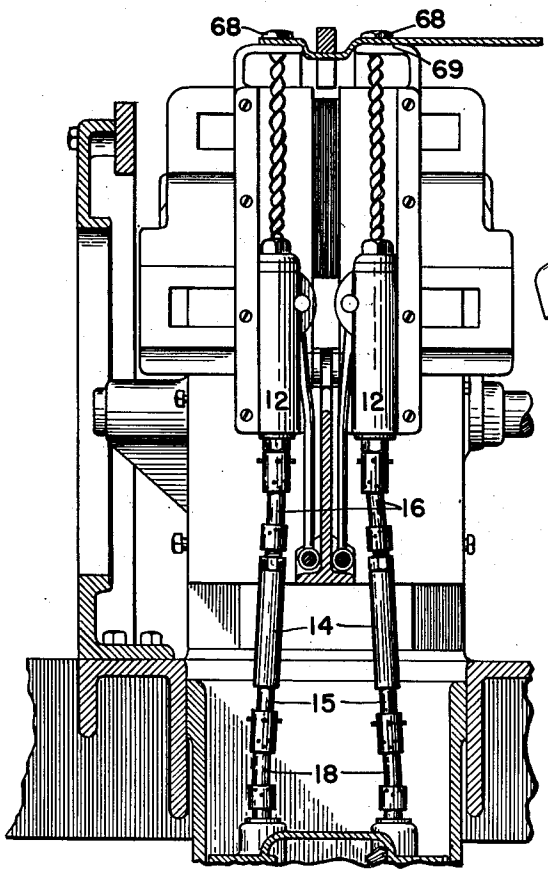


FIG. 3

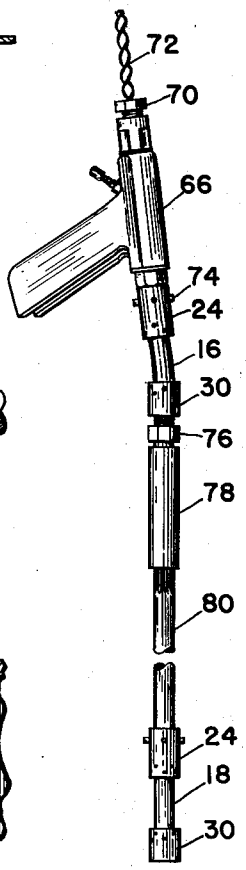


FIG. 4

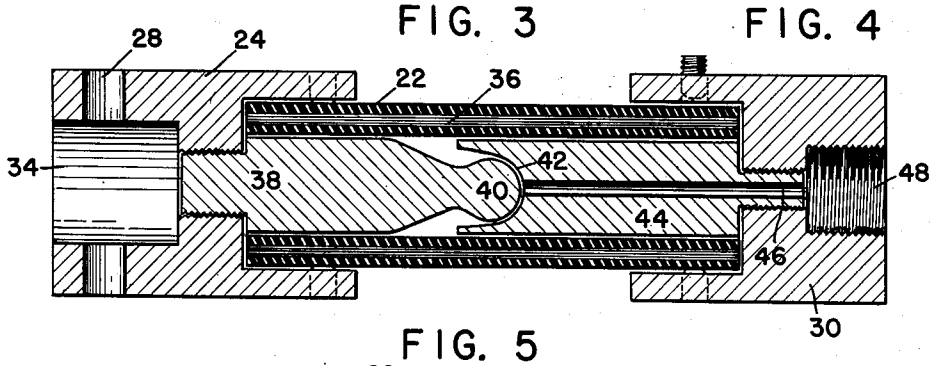


FIG. 5

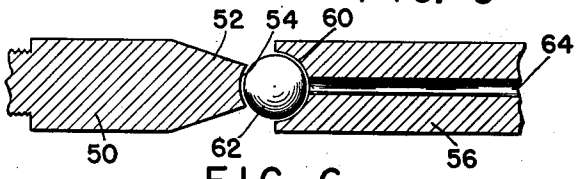


FIG. 6

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KNUCKLE JOINT FOR TIE BORING MACHINES

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2 Claims. (Cl. 64—11)

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This invention relates to improvements in machines for boring holes in railroad ties adapted to receive the spikes which secure the rails to the ties. More particularly, this present invention relates to couplings or joints to be used in such tie boring machines.

Some of the objects of the present invention are to provide an improved joint or coupling for joining the meeting ends of two shafts; to provide a flexible joint which automatically compensates for misalignment of the shafts without loss of efficiency, undue wear, or excessive stress and strains; to provide a flexible type joint which functions automatically to correct the angular as well as parallel misalignment of the two shafts joined by the device of the present invention.

Other and further objects of the invention and the advantages of the same will be pointed out hereinafter and indicated in the appended claims, or will be obvious to one skilled in the art, upon understanding the present disclosure.

For the purpose of this application, there has been selected to set forth two particular structures, but it is to be understood that they are here presented for illustrative purposes only and are not to be accorded any interpretation such as might have the effect of limiting what is claimed as the invention short of its true and comprehensive scope in the art.

In the accompanying drawings:

Figure 1 represents a vertical sectional view through a bit supporting head of a tie boring machine;

Figure 2 is a view of the improved flexible coupling to be used in the tie boring machine;

Figure 3 is a side elevational view through the head of a tie boring machine;

Figure 4 is a side elevational view of modified form of bit supporting and operating means;

Figure 5 is a sectional view taken along lines 5—5 of Figure 2; and

Figure 6 is a sectional view of the modified form of the flexible or universal joint.

In the usual tie boring apparatus, ties are placed on slide rails 10 by hand or any other suitable means. The tie carriage then moves the ties 11 forward and by suitable means (not shown) centers the ties over the two groups of bits 72. After the ties are centered and held down, the bits will be fed upward to make the necessary spike holes. After the ties are bored the bits are retracted and the tie discharged from the machine. Generally, there are two header casings 69 for supporting bit mechanism. The tie slide rails 10 are located adjacent each header casing. Generally, in tie boring machines, the

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tie sliding or feeding, tie centering, and tie boring actions, all operate simultaneously.

The rotary bit spindles 12 are suitably supported and the bits 72 are screwed or otherwise secured to the ends of the spindles 12. Each spindle is driven through means of a shaft 14 (Figures 1 and 3) or shaft 80 (Figure 4). In Figures 1 and 3 keyed shafts 14 are of the telescoping type and have universal joints positioned at the upper and lower ends. In Figure 4 shaft 80 is of the splined type and there is positioned at the lower end of shaft 80 universal joint 18 and at the upper end of splined sleeve 78 another universal joint.

The railroad ties to be bored are moved along on supporting means 10 and are positioned over the tie boring heads. Bit supporting means 12 are located in the header casing 69 and are connected through means of flexible coupling or universal joint 16 to shafts 14 and at the lower end of the shaft 15 is in turn connected a flexible coupling 18. Flexible coupling 18 is operatively connected to a suitable source of power through gears 20.

The flexible or universal coupling 16 includes flexible hosing member 22 which is suitably secured to heads 24 and 30 by any suitable means such as screws 26. For securing the end 24 to the bit supporting member 12, hole 28 is provided for receiving a suitable pin such as is shown at 74 in Figure 4. End 24 is provided with opening 34 into which the lower end of the bit driving member is received. The flexible hosing 22 is preferably of the type having reinforcing wires 36 extending therethrough. Suitably secured in member 24 is member 38 which has on one end thereof ball-shaped member 40. This ball-shaped member is adapted to fit into a cup-like member 42 in member 44. So that a lubricant can be forced into and around member 40, lubrication channel 46 extends through member 44 and terminates in opening 48 and member 30. It is preferred that the opening 48 be screw threaded for coupling it to the shaft 14 and for receiving the lubricating nozzle.

In Figure 6 is shown a modified form of the flexible coupling in which member 50 is provided with a tapered end 52 and a cup-shaped portion 54 in which is positioned metal ball 62. Member 56 is provided with a cup-shaped end 60 into which the ball 62 partially extends. The member 56 is provided with a lubricating channel 64. The modified form shown in Figure 6 is adapted to take the place of members 38 and 44 shown in Figure 5.

In Figure 4 is shown a modified form of the

driving and bit supporting means. This includes upper and lower flexible couplings 16 and 18. Coupling 16 is secured through member 24, pin 74 to bit supporting means 66. Bits 72 are adapted to pass through opening 68 in the head 69. The bits 72 are removably secured in member 66 by a suitable member 70. The upper flexible joint 16 is secured to member 78 by threaded nut-like member 76. Member 78 is slidably connected to member 80 through a spline-like joint. Lower flexible coupling 18 is connected by member 24 to member 80 and the lower end 30 is suitably connected to a source of power for driving the bit 72.

What is claimed is:

1. A coupling for tie boring apparatus comprising spaced alined metal ends, one end adapted to threadedly receive a shaft and the other end adapted to slidably receive a shaft, centering members threadedly connected to the end members and extending axially therefrom, with the free ends having concave seats therein, with one of the concave seats of greater depth than the other concave seat, the diameter of the centering members being less than the diameter of the end members, the ends of one of the centering members tapered, a substantially spherical-shaped member positioned between the ends of the centering members and in the concave seats in a ball and socket arrangement, a hollow reinforced hose member secured to the end members and being of less diameter than the end members and extending parallel to the longitudinal sides of the centering members, and one of the centering members having a lubricating channel extending therethrough.

2. A coupling for tie boring apparatus comprising spaced end members having an axial bore adapted to be attached to a driving and a driven member, centering members threadedly connected to the end members and extending axially therefrom, with the free end of each having a concave seat therein, the diameter of the centering member being less than the diameter of the end members, the ends of one of the centering members tapered, a spherical-shaped member positioned between the ends of the centering members and in the concave seats in a ball and socket arrangement, a hollow hose member attached to the end members and extending parallel to the axis of the centering members, and one of the centering members having a lubricating channel extending therethrough.

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