

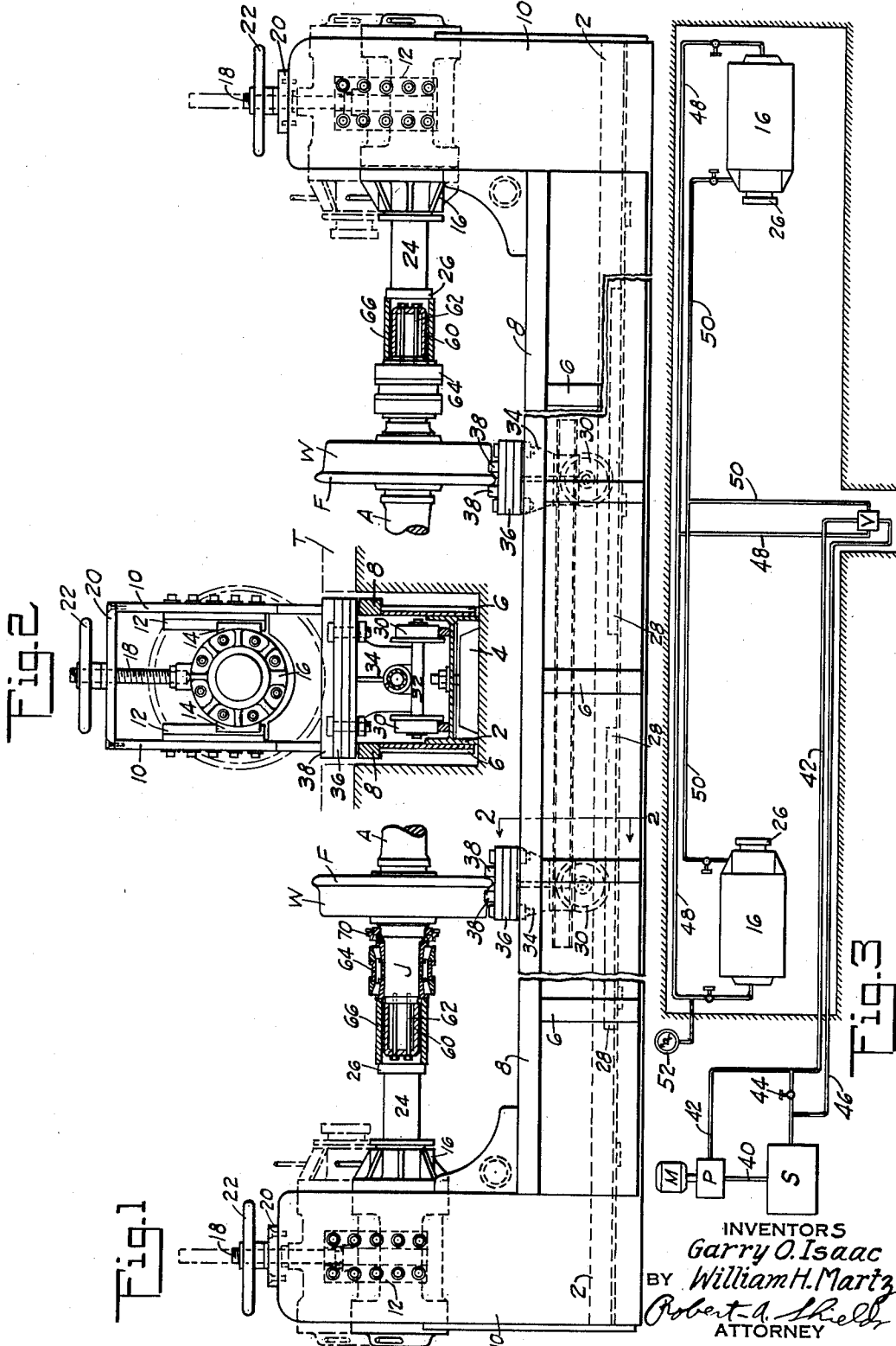
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PROCESS FOR MOUNTING ROLLER BEARINGS ON CAR AXLES

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## PROCESS FOR MOUNTING ROLLER BEARINGS ON CAR AXLES

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4 Claims. (Cl. 29—148.4)

This invention relates to a process for pressing bearings on axles and particularly to such a process for pressing roller bearings on railway car axles.

In railway car work the wheels are pressed on the axle to a definite gauge line and previously the bearings have been pressed on the axle journals until they reach a definite position with respect to the wheels. Such procedure is extremely slow and permits slight inaccuracies due to the measurements having to be made to rough portions of the car wheel. Also, this previous procedure was quite slow and expensive in addition to being inaccurate. It is an object, therefore, of the present invention to provide a process for simultaneously pressing the bearings on both ends of the axle.

A further object of the invention is the provision of a process for pressing bearings on axles in which all parts are free to float and equalize pressures and travel at all times.

These and other objects of the invention will be apparent to persons skilled in the art from a study of the following description and accompanying drawings, in which:

Fig. 1 is an elevational view of the improved machine with parts broken away to better disclose the construction;

Fig. 2 is a sectional view taken substantially on line 2—2 of Fig. 1, and

Fig. 3 is a schematic diagram of the hydraulic system of the machine.

Referring now to the drawings in detail it will be seen that the machine consists of a frame member having a bottom formed by a heavy I-beam 2 and by means of which the machine may be bolted or otherwise secured in a pit 4 extending transversely of the assembly tracks T (Fig. 2). Welded or otherwise secured to the flanges of the I-beam base are upstanding plates 6 suitably braced and to the upper edge of which are fastened heavy bars 8 forming the top chord of the side pieces. Extending upwardly from the ends of the side pieces are spaced upright members 10 suitably attached and buttressed to the side pieces. Guideways 12 are bolted or otherwise secured to the inner surfaces of the uprights 10 and adapted to cooperate with guide members 14 attached to cylinders 16. The cylinders 16 have fastened thereto an upwardly projecting lead screw 18 extending through a top plate 20 joining the uprights 10. Upon the upper end of the lead screw 18 is applied a hand wheel or other device 22 by means of which the cylinders may be raised or lowered in the guides 12 carried by the uprights 10. Each cylinder is provided with a piston 24 having a pushing head surface 26. Intermediate the uprights 10 the machine is provided with bars 28 welded or otherwise secured to the web of the I-beam 2. These bars form tracks for small wheels 30 carrying axles 32, which axles in turn support a frame 34 on which are bolted or otherwise secured plates 36. The plates 36 have welded or otherwise attached thereto bars 38 spaced apart a sufficient distance as to permit the flange of the railway car wheels

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to move therebetween while the tread portion is supported on one of the bars, all as clearly shown in Fig. 1. By changing thickness of the plates 36 the bars 38 may be readily adjusted to bring the upper surface of the bars 38 flush with the assembly track T.

In order to actuate the pistons 24 of the cylinder 16 a hydraulic or other pressure system is provided, which system consists of a prime mover or motor M driving a pump P. The pump draws fluid from a sump S through pipe 40 and discharges the fluid through a high pressure pipe 42 to a four-way valve V. In order to limit the pressure in the high pressure pipe a safety valve 44 is connected in a line joining the high pressure line 42 and a sump discharge line 46. From the four-way valve high pressure fluid may be led through pipes 48 to the far ends of the cylinders 16, while any fluid which is trapped between the piston and the packed end of the cylinder will be discharged through pipes 50 and 46 to the sump S. When the four-way valve V is thrown to its second position, pressure may be supplied to pipes 50 to retract the pistons, in which case the trapped fluid at the head end of the cylinder will be discharged through pipes 48 and 46 into the sump. For purposes of observing the operation of the safety valve 44 and to insure sufficient bearing press pressure, a gauge 52 may be applied anywhere in the piping 48.

It will be seen that high pressure fluid supplied from the pump P, pipe 42, four-way valve V and pipes 48 must exert equal pressure on the pistons of cylinders 16. Accordingly, any force exerted by the pushing heads 26 will be equal, thus insuring that the bearings will be pressed on the axles with equal pressures.

In use the wheels W pressed on axle A will be rolled into the machine along tracks T with the flanges F located between the bars 38 and the treads of the wheels supported on the outermost bars, which bars preferably have a very slight depression in them to hold the wheels against accidental rolling beyond their proper position in the machine. Either immediately before or after the wheel and axle assemblies are spotted in the machine by rolling along tracks T and bars 38, axle extensions or bearing assembly guide members 60 are temporarily bolted as at 62 to the ends of the axle. These extensions are of slightly smaller diameter than the journal portions J of the axle but of sufficient length to support the bearing assemblies in substantially axial alignment therewith. After bolting the extensions on the axle, complete roller bearing assemblies 64 are slipped onto the extensions and pushing sleeves 66 interposed between the bearing assemblies and the pushing heads 26. With the parts in this position, the hydraulic pressure is turned on and the pushing heads 26 move toward each other simultaneously with equal and opposite pressures and through means of sleeves 66 simultaneously force the bearing assemblies onto the axle journals and to their final position in which the inner race tightly abuts the stop ring and dust collars 70 previously shrunk on the axle at the inner end of the journal portion. It is obvious that the bearing assemblies can not be made to move uniformly on the axles even though the pressures be uniform and, accordingly, the wheel flanges might be damaged except for the fact that the entire assembly is mounted on the carriage which can roll by means of wheels 30 on the tracks 28. It will accordingly be seen that not only is the hydraulic or fluid pressure fully equalized through the piping, but the mechanical forces are also fully equalized through the shifting of the carriage carrying the wheel and axle assemblies. After the bearing assemblies 64 have been pushed tightly against the stop and sealing ring 70, pressure is applied until the safety valve 44 releases at a predetermined pressure. In practice it has been found that a

pressure of approximately twenty tons is a satisfactory setting for the safety valve 44.

It will be obvious in case different diameter wheels W are used the axle may be shifted up or down, but by means of the hand wheels the cylinders 16 may be readily adjusted so as to bring the pushing head 60 into direct alignment with the axis of the axle. Likewise, in certain cases, due to changing of track gauge, etc., the overall length of the axles will vary and it may be necessary to provide shorter or longer axle extensions 60 and pushing collars 66.

After the bearings have been pushed to their full true position against the stops 70, the pistons of cylinders 16 will be retracted by proper manipulation of valve V and the pushing sleeves 66 and axle extensions 60 removed. These latter may be removed either before or preferably after the wheel and axle assembly with bearings pressed thereon has been rolled out of the machine, thus freeing the machine for the following wheel and axle assemblies. While the invention has been described more or less in detail with particular reference to the drawings, it will be obvious that various modifications and rearrangements of parts may be made without departing from the scope of the invention as defined by the following claims.

What is claimed is:

1. The process of providing a wheel and axle assembly with roller bearings on the journals at each end of the axle, which comprises supporting the wheels of the assembly in such a manner as to permit axial movement thereof, securing guide members on the ends of the axle of sufficient length to support complete roller bearing assemblies in substantially axial alignment with said journals, slipping said roller bearing assemblies onto said guide members for such support thereby outwardly of the axle journals, and applying equal forces to said bearing assemblies to simultaneously force the same off of said guide members onto said axle journals and to a predetermined position while said wheel and axle assembly is so supported for axial movement.

2. The process of providing a wheel and axle assembly with roller bearings on the journals at each end of the axle, which comprises shrinking sealing and stop collars on the axle adjacent the inner ends of the journals, securing guide members on the ends of the axle of sufficient length to support complete roller bearing assemblies in substantially axial alignment with said journals, slipping said roller bearing assemblies onto said guide members, interposing tubular pushing sleeves between the outer ends of said roller bearing assemblies and the inner ends of pressure applying means, and applying equal forces to said sleeves thereby simultaneously forcing said bearing assemblies along the guide members while supported thereon in substantially axial alignment with said axle journals onto the axle journals and into contact with said stop collars.

3. The process of providing a wheel and axle assembly with roller bearings on the journals at each end of the axle, which comprises shrinking sealing and stop collars on the axle adjacent the inner ends of the journals, securing guide members on the ends of the axle, slipping complete roller bearing assemblies onto said guide members, said guide members being of sufficient length to support said bearing assemblies in substantially axial alignment with said axle journals adjacent the outer ends thereof, interposing tubular pushing sleeves between the outer ends of said roller bearing assemblies and the inner ends of fluid pressure means, supplying fluid under pressure from a common source to said means thereby simultaneously forcing said bearing assemblies along said guide members and onto the axle journals and into contact with said stop collars, and removing said pushing sleeves and guide members from the wheel and axle assembly.

4. The process of providing a wheel and axle assembly with roller bearings on the journals at each end of the axle having sealing and stop collars thereon adjacent the inner ends of the journals, which comprises supporting the wheels of the wheel and axle assembly in such a manner as to permit axial shifting thereof, securing guide members on the ends of the axle of sufficient length to support complete roller bearing assemblies in substantially axial alignment with said journals, slipping said roller bearing assemblies onto said guide members for support thereby outwardly of and in substantially axial alignment with the axle journals, interposing tubular bearing assemblies and the inner ends of fluid pressure means, supplying fluid under pressure from a common source to said means thereby simultaneously forcing said bearing assemblies toward each other along said guide members while so supported thereby and onto the axle journals into contact with said stop collars while permitting full axial floating movement of the wheel and axle assembly.

References Cited in the file of this patent

UNITED STATES PATENTS

504,030	Gordan	Aug. 29, 1893
504,031	Gordan	Aug. 29, 1893
689,455	Bickford	Dec. 24, 1901
1,146,272	Neukirch	July 13, 1915
1,597,340	Best	Aug. 24, 1926
1,598,599	Buckwalter	Sept. 7, 1926
1,707,905	Derbyshire, Jr.	Apr. 2, 1929
1,748,971	Buckwalter	Mar. 4, 1930
1,748,973	Buckwalter	Mar. 4, 1930
1,753,771	Buckwalter	Apr. 8, 1930
2,438,214	Horger	Mar. 23, 1948