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CAR WHEEL GRINDING MACHINE

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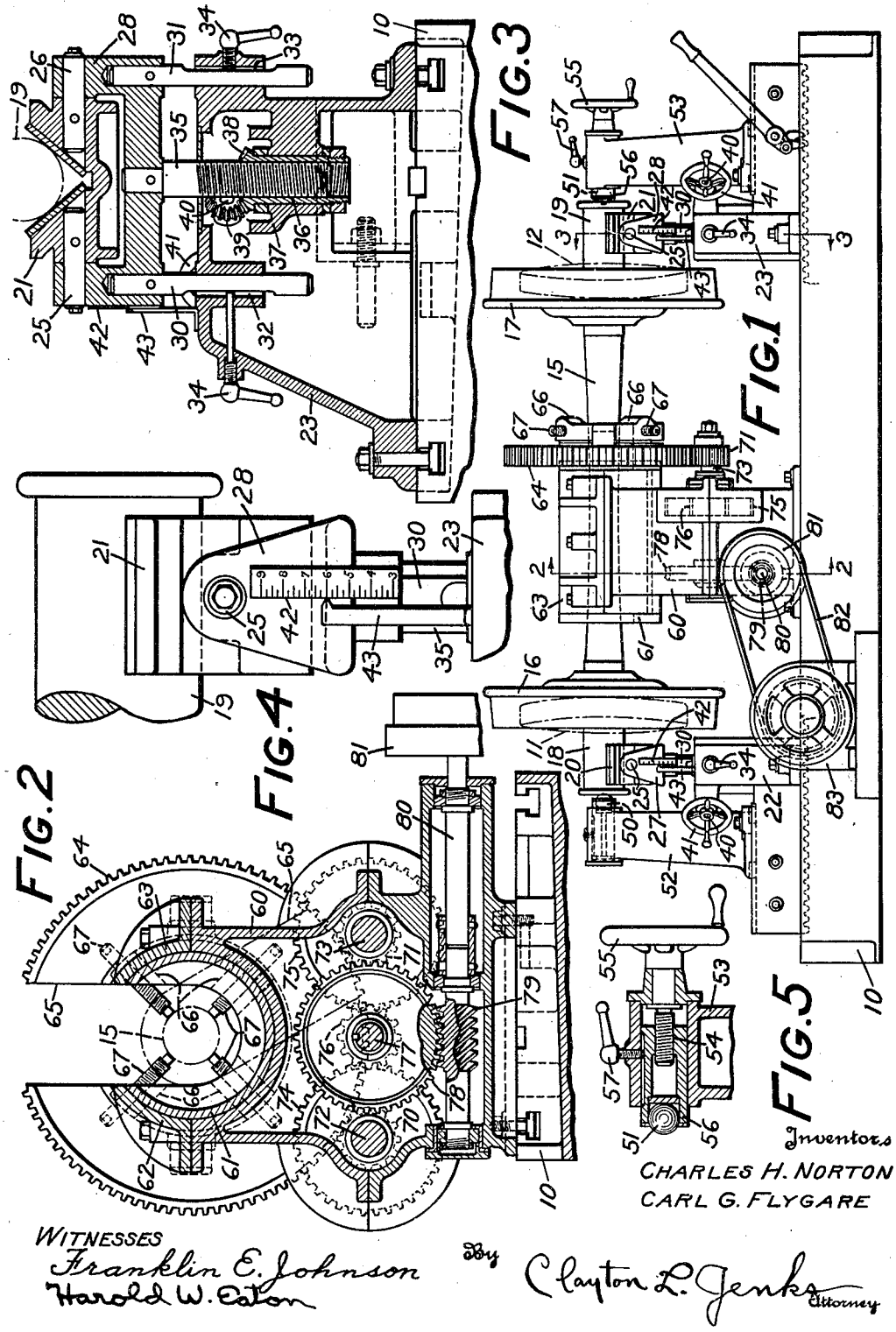


FIG. 3

FIG. 1

FIG. 4

FIG. 2

FIG. 5

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CAR WHEEL GRINDING MACHINE

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4 Claims. (Cl. 51—236)

This invention relates to grinding machines, and more particularly to machines for grinding car wheels.

Heretofore, various machines have been devised for the grinding of car wheels, in which the pair of car wheels assembled on their axle may be simultaneously ground. Numerous features have been incorporated in such machines, which handicapped the operator in securing the maximum production on the machine. In such a machine, it is necessary to engage and drive the axle from between the wheels by means of an annular driving gear. In the previous machines, a removable segment of the gear has been provided to permit the operator to drop the axle of the car wheel assembly into place and then close the open end of the U-shaped aperture by means of the removable gear segment. This construction necessitated a delay in removing the finish ground shaft from the machine and also in inserting a new car wheel assembly for grinding. The present invention is intended as a distinct improvement over such prior constructions as shown in the patent to Norton No. 869,194 dated October 22, 1907.

It is the primary object of this invention to overcome this difficulty and to provide a driving gear and rotating mechanism which is so arranged that it is not necessary to provide a removable gear segment to obtain rotation of the work during grinding.

In prior constructions, such as shown in the prior Norton patent above referred to, no provision is made for adjusting the axis of the car wheel axle so as to take care of car wheel assemblies having different sizes of journals so that the axis of the axle may be adjusted to coincide with the axis of rotation of the driving mechanism.

It is a further object of this invention to provide a suitable work supporting mechanism which is adjustable so that regardless of the size of the journals on the car wheel assembly, the axis of the axle may be adjusted to coincide with the axis of rotation of the driving member.

With these and other objects in view, as will be apparent to one skilled in the art, this invention resides in the combination of parts set forth in the accompanying description and covered by the claims appended hereto.

One embodiment of this invention has been illustrated in the drawing, in which like reference numerals indicate like parts:

Fig. 1 is a front elevation of the improved car wheel grinding machine, showing only the work rotating and supporting mechanism, with the grinding wheels indicated in broken lines;

Fig. 2 is a fragmentary cross-sectional view, on an enlarged scale, taken approximately on the line 2—2 of Fig. 1, showing the work rotating mechanism;

Fig. 3 is a fragmentary cross-sectional view, on an enlarged scale, taken approximately on the line 3—3 of Fig. 1, showing one of the work supporting members and its adjusting mechanism;

Fig. 4 is a fragmentary elevation, on an enlarged scale, of one of the work supporting heads; and

Fig. 5 is a fragmentary longitudinal sectional view through the right-hand end thrust member, as shown in Fig. 1.

In accordance with this invention, a car wheel grinding machine is provided in which the peripheries of a pair of spaced car wheels, mounted on their supporting axle, are simultaneously ground. In a machine of this type, a pair of spaced car wheels assembled on their axle is inserted and supported, by the spaced journals at opposite ends of the axle, on a pair of spaced vertically adjustable V-shaped bearing shoes. The axle is dropped within a substantially U-shaped aperture in a work driving and rotating gear, which is arranged to surround and engage a central portion of the axle between the car wheels. A motor driven work driving mechanism is provided, which is so constructed and arranged that the driven gear which is directly connected to rotate the car wheel assembly may be uniformly rotated without the necessity of closing the open end of the U-shaped aperture in the gear.

As illustrated in the drawing, the improved car wheel grinding machine comprises a base 10 having a pair of grinding wheels 11 and 12 which are mounted on suitable wheel slides (not shown). These wheels slides are mounted for a longitudinal, as well as a transverse, movement to permit a feeding, as well as a traversing, movement of the grinding wheel relative to the car wheel being ground. The arrangement of the wheels is not any part of the present invention and consequently, has not been illustrated in detail. Only an indication of the grinding wheels within their respective positions relative to the work piece has been indicated. For further disclosure as to the mounting and movement of the grinding wheels, reference may be had to the patent to Norton No. 869,194 dated October 22, 1907.

Work supporting mechanism

A car wheel assembly, comprising an axle 15, having car wheels 16 and 17 mounted adjacent opposite ends thereof and provided with the journals 18 and 19, is mounted for rotation on spaced work supporting members so that the periphery of the car wheels may be ground as desired. As illustrated in the drawing, the work supports comprise a pair of spaced V-shaped members 20 and 21 which are supported by brackets 22 and 23 on the base 10.

In order that the bearing surfaces may be aligned with the surface being supported, the V-shaped work supports 20 and 21 are preferably pivotally mounted, as by trunnions 25 and 26, to vertically adjustable supporting members 27 and 28. It will be readily apparent from the foregoing disclosure that when the car wheel assembly is placed in the machine, the journals 18 and 19 engaging the V-block supports 20 and 21 will cause the V-blocks 20 and 21 to rock and align their bearing surfaces with the surface of the journals on the car axle.

A car wheel grinding machine of the type illustrated is particularly adapted for regrinding or surfacing of car wheels after they have been in use, to eliminate a worn surface having flats and other irregularities due to un-uniform wear. The journals 18 and 19 of successive car wheel assemblies vary in size, due to wear in use of the assembly and also to the amount of grinding which has heretofore taken place. It is, therefore, desirable that a suitable adjusting mechanism be provided to adjust the ends of the car axle vertically so that the axle of the car wheel assembly may be moved to coincide with the axis of the rotating driving member.

The supporting members 27 and 28 are provided with vertical guide rods 30 and 31 which slide in apertures 32 and 33 in the brackets 22 and 23 respectively. The guide rods serve to hold the members 27 and 28 in proper alignment. Suitable clamping devices, such as the clamping screws 34, are provided to lock the guide rods 30 and 31 in fixed position with the brackets 22 and 23 after the V-shaped bearing supports have been adjusted.

The members 27 and 28 carry a depending screw threaded member 35 which meshes with a rotatable nut 36 supported in a portion 37 of the brackets 22 and 23. The threaded bushing 36 is provided at its upper end with a bevel gear 38 meshing with a bevel gear 39 on a shaft 40. The outer end of the shaft 40 is provided with a hand wheel 41. By turning the hand wheel 41, the operator may raise or lower the work supporting members 20 and 21, as desired.

To facilitate adjustment of the opposed spaced bearing members 20 and 21, a suitable indicating device is provided so that the operator may readily adjust both of the V-shaped bearing supports to the same extent. The operator measures the size of the car axle journal and then adjusts the V-shaped supporting members to the proper height so that the axis of the axle will coincide with the work rotating and driving member. This positioning mechanism may comprise a scale 42 which is fixed to each of the supports 27 and 28 and an indicating finger or arrow 43, which is supported on each of the brackets 22 and 23. It will be readily appreciated from this construction that if the operator finds the journals 18 and 19 are 6" in diameter, he may then adjust each of the V-shaped work supporting members 20 and 21 until "6" on the scale is opposite the indicator or arrow point 43, indicating that the V-shaped supports are positioned to support a car wheel assembly having journals of 6" diameter in proper relation with the work rotating and driving mechanism.

End thrust device

In driving a pair of opposed car wheels mounted on an axle, it is necessary that the axle be held against endwise movement, since it is necessary to grind up to and adjacent the flange on the car wheel. To prevent endwise movement of the axle 15, suitable anti-friction bearing members 50 and 51 are mounted at opposite ends of the base 10 and arranged to engage opposite ends of the axle 15. The anti-friction bearing members 50 and 51 are supported on brackets 52 and 53 respectively. The bearing member 51 is provided with a readily accessible adjusting screw 54 which may be turned by a hand wheel 55 and adjusted to position the car axle in proper condition for grinding without endwise movement. A screw 54 meshes with a thread in the longitudinally movable spindle 56 which may be clamped in adjusted position by means of a clamping screw 57. For further detail as to the construction and the operation of these anti-friction end thrust members, reference may be had to the prior patent to Norton No. 869,194.

Work rotating and driving mechanism

In grinding work of this type, it is necessary that the work be driven by the center portion of the axle 15 between the car wheels 16 and 17. As illustrated in the drawing, this driving mechanism may comprise a supporting frame 60 carrying a hollow spindle 61 which is held in place by the partial cylindrical caps 62 and 63. The spindle carries at its right-hand end, as viewed in Fig. 1, a driving gear 64 which is fixedly mounted on the spindle. The gear and the spindle are provided with a substantially U-shaped slot or aperture 65 which extends from the periphery of the gear and spindle to the center of the same so that, as shown in Fig. 2, the car axle 15 may be readily dropped into position with its axis coinciding with the axis of the driving spindle and gear. The driving gear 64 is provided with a plurality of spaced brackets 66, each of which carries a clamping screw 67, which are equally spaced to engage the axle 15 and transmit rotary motion of the driving gear 64 so as to rotate the axle 15 and the car wheels 16 and 17 during the grinding operation.

To attain one of the objects of this invention, namely, to provide an open driving gear without the necessity of providing a removable gear segment to close the periphery of the gap, a pair of spaced driving pinions 70 and 71 is mounted on the shafts 72 and 73 respectively. The shafts 72 and 73 carry driving gears 74 and 75 which mesh with a single driving pinion 76 on a shaft 77. The shaft 77 carries a worm gear 78 meshing with a worm 79 on a drive shaft 80. The outer end of the shaft 80 is provided with a stepped cone pulley 81 which is connected by a driving belt 82 with an electric motor 83. The pulley drive is provided to permit a change of the work speed when desired. The spacing of the pinions 70 and 71 is such that one of the pinions is always in mesh with the driven gear 64 so that when the U-shaped gap turns so that the gear teeth of one gear run out of mesh with one of the driving pinions, the other driving pinion is in mesh and

continues a uniform rotation of the gear 64. Then, before the U-shaped slot turns so that the teeth of the second driving gear run out of mesh, the first gear again meshes and continues the rotation. This driving arrangement eliminates the necessity of providing a gear segment to close the U-shaped gap, thereby saving the loss of time necessitated by inserting and removing a gear segment so as to increase the efficiency of the machine.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:

1. A car wheel grinding machine comprising a supporting and rotating device for a car wheel assembly, having a pair of car wheels and an axle, including a pair of spaced V-shaped shoes arranged to engage and support the periphery of journals at opposite ends of the car wheel axle, a pair of yoked supports for said shoes, and trunnions arranged transversely on each of the supports and carrying said shoes which are arranged to align the shoes with the car axle journal longitudinally relative to the axis of the axle.

2. A car wheel grinding machine comprising a supporting and rotating device for a car wheel assembly, having a pair of car wheels and an axle, including a pair of spaced V-shaped work supporting shoes arranged to engage and support the periphery of journals at the opposite ends of the car wheel axle, spaced yoked supports for said shoes, trunnions on said supports arranged transversely relative to the axis of said axle and carrying said shoes which are arranged to align the shoes longitudinally with the work periphery, and means to adjust said supports vertically to accommodate different diameters of journals so that the car wheel axle may be aligned with the axis of said driving member.

3. A car wheel grinding machine comprising a supporting and rotating device for a car wheel assembly, having a pair of car wheels and an axle, including a pair of spaced members arranged to engage and support the periphery of journals at opposite ends of the car wheel axle, means including a driving gear to rotate the car wheel axle about the gear axis, and means including an indicator associated with each of said members to adjust the members vertically, said indicators serving for setting the position of the work supports so as to align the axis of the car wheel with the axis of the driving gear.

4. A car wheel grinding machine comprising a supporting and rotating device for a car wheel assembly, having a pair of car wheels and an axle, including a pair of spaced members arranged to engage and support the periphery of the journals at opposite ends of the car wheel axle, means including a rotatable driving gear which surrounds the car wheel axle at a point intermediate its end and has a substantially U-shaped work receiving aperture extending from its periphery to its center, means to adjust said members vertically to align the axis of the axle with the axis of said gear, clamping means carried by said gear which is arranged to engage the periphery of the car wheel axle to rotate the same, a pair of spaced driving pinions meshing with said gears to rotate the gear and the work, and a driving mechanism including a single driver which rotates both of said pinions in synchronism, said pinions being spaced so as to span the aperture in the periphery of said gear to rotate the same continuously.

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