Aug. 5, 1952 O. E. HILL 2,605,591

CAR WHEEL GRINDING MACHINE

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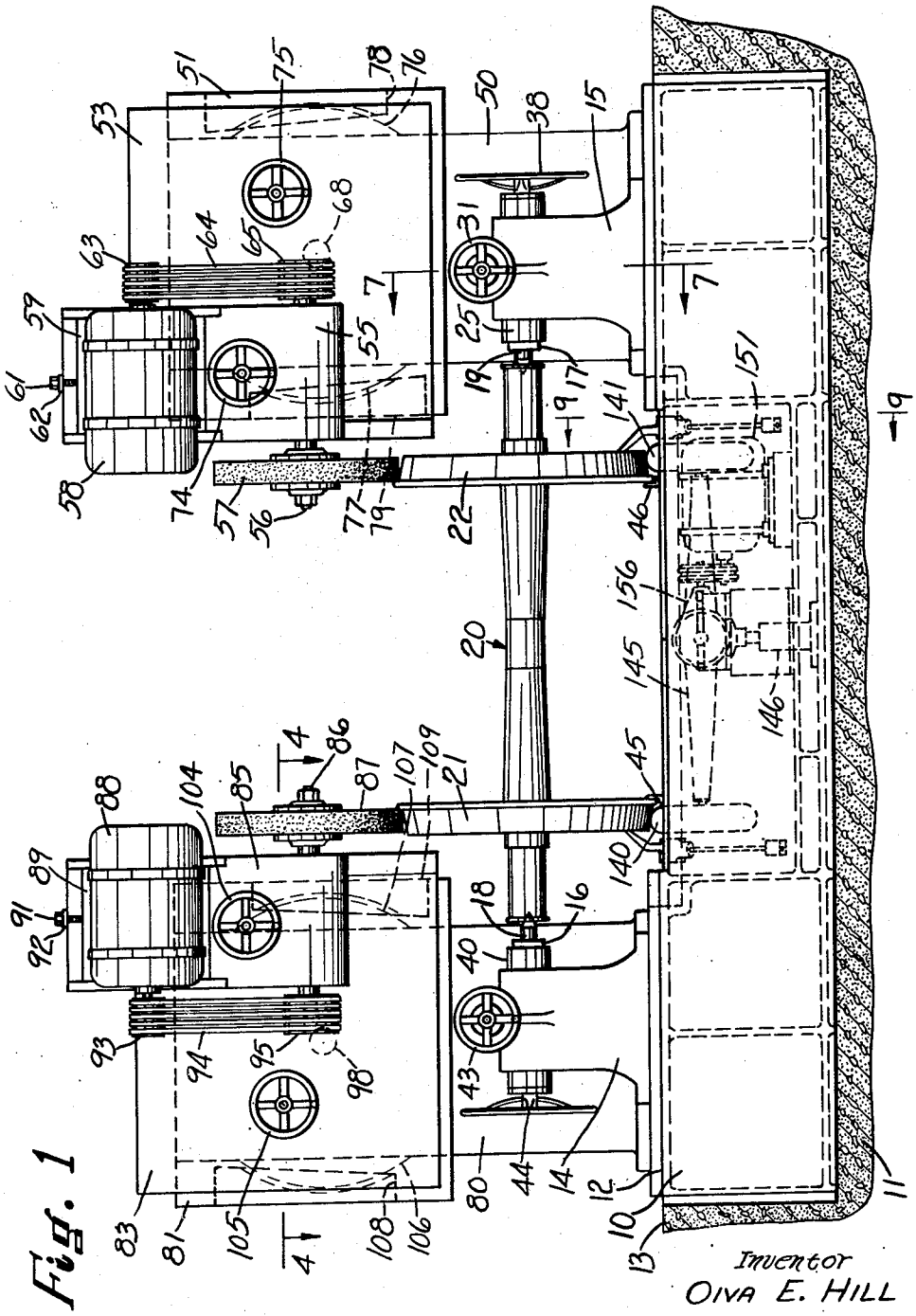


Fig. 1

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CAR WHEEL GRINDING MACHINE

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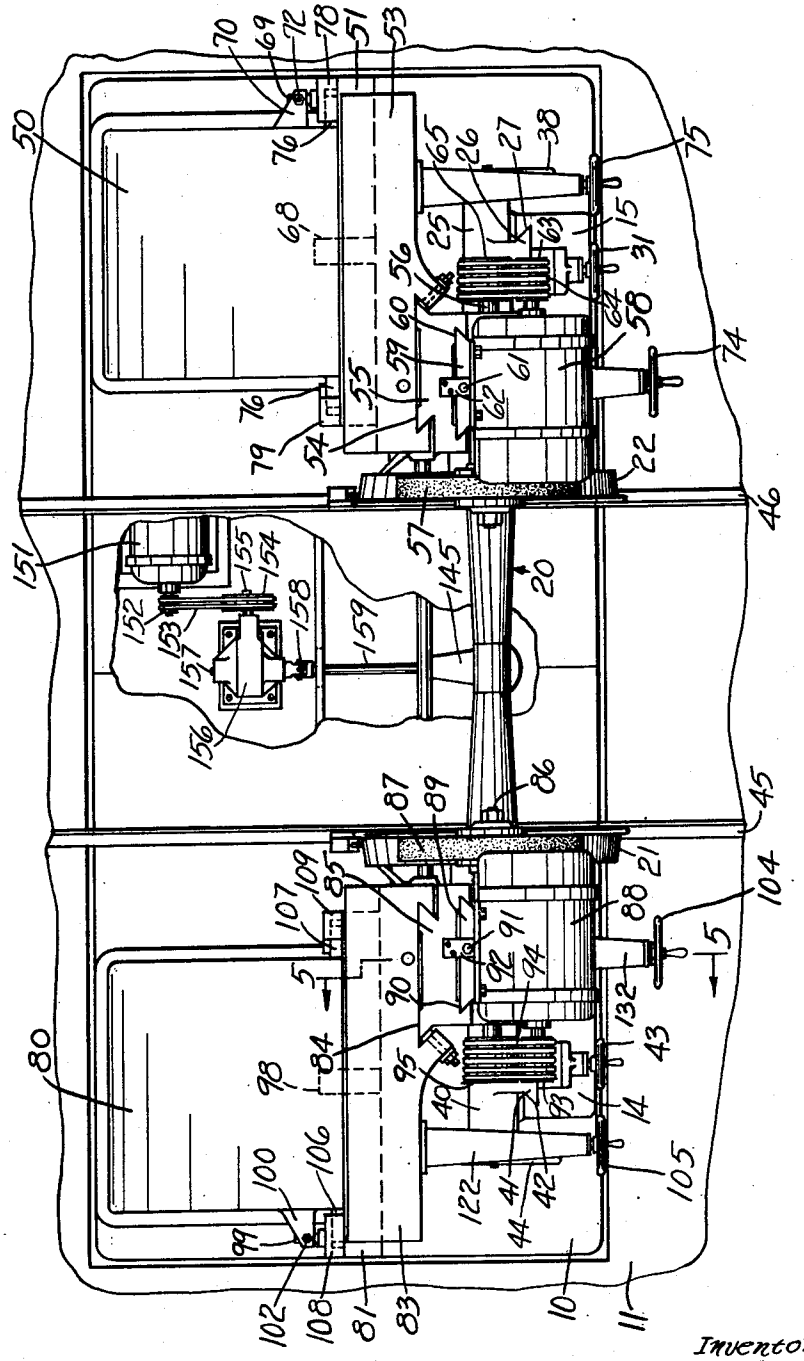


Fig. 2

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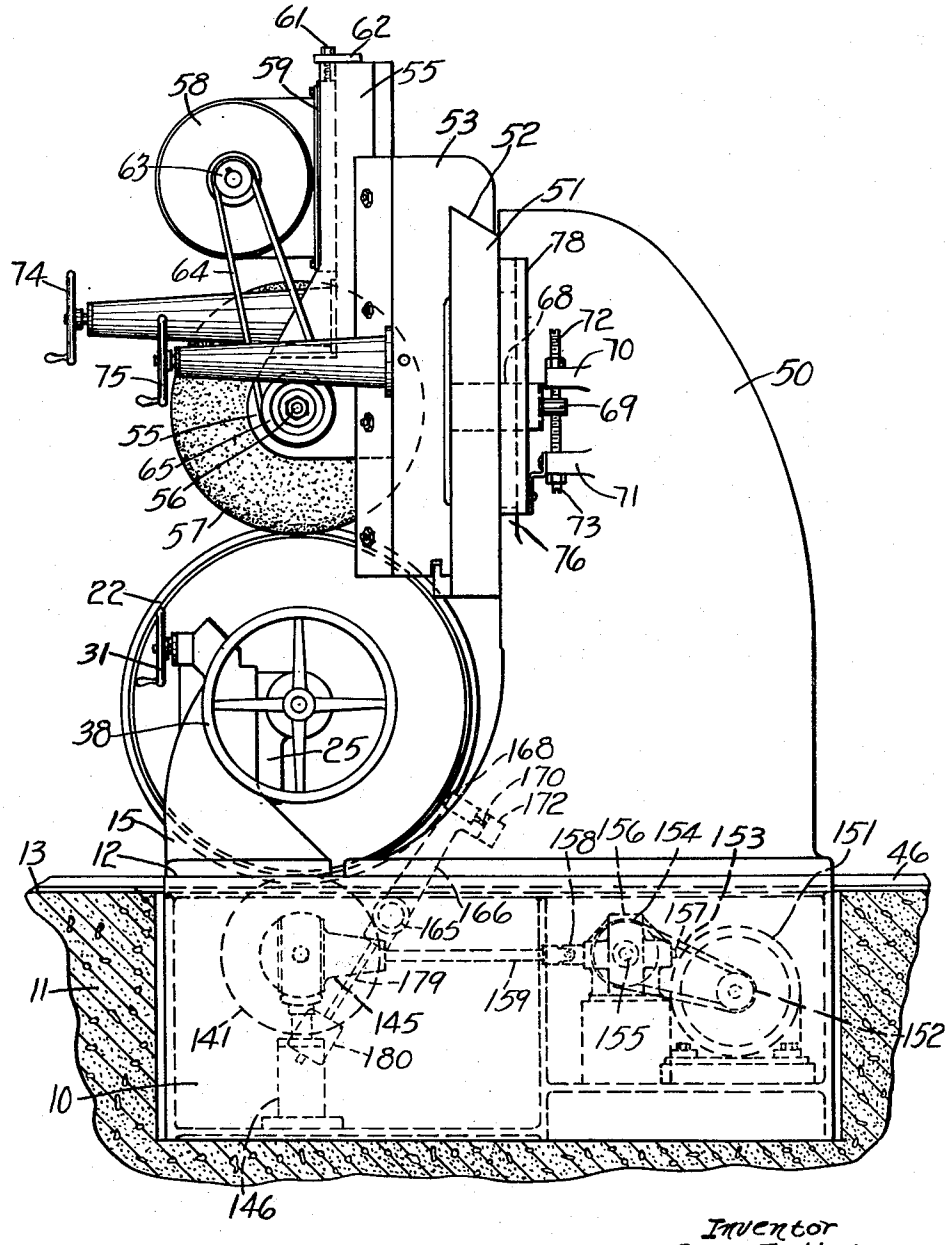
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CAR WHEEL GRINDING MACHINE

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Fig. 3



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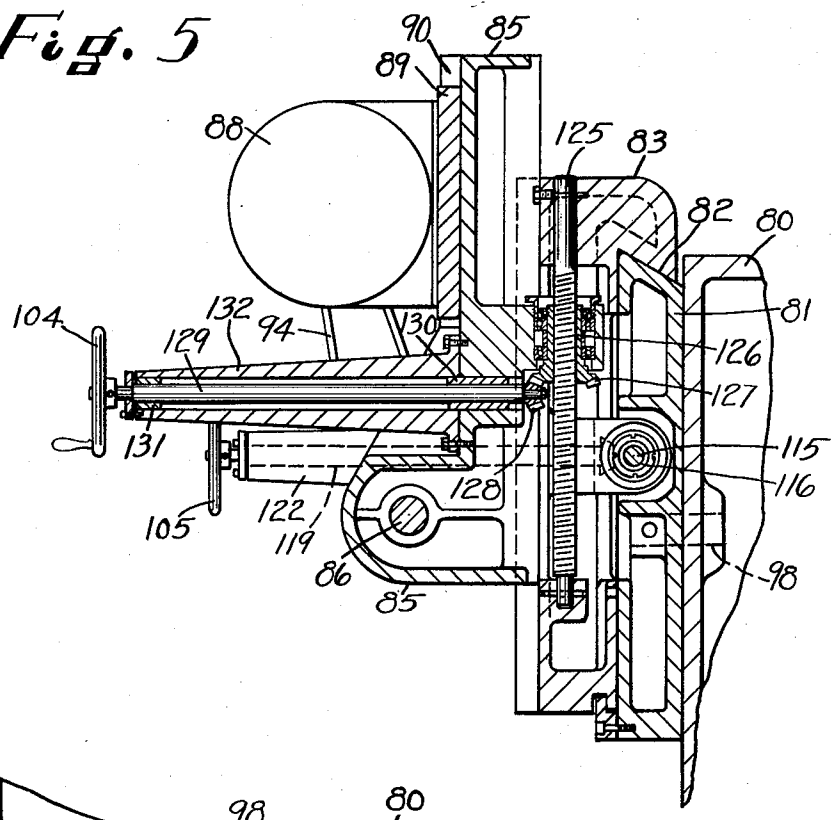
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CAR WHEEL GRINDING MACHINE

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Fig. 5



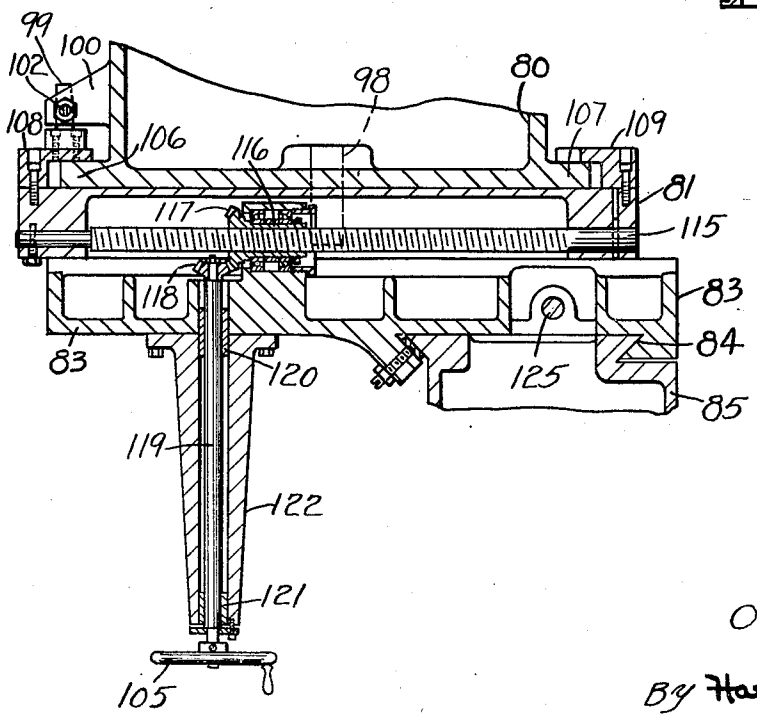


Fig. 4

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CAR WHEEL GRINDING MACHINE

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Fig. 8

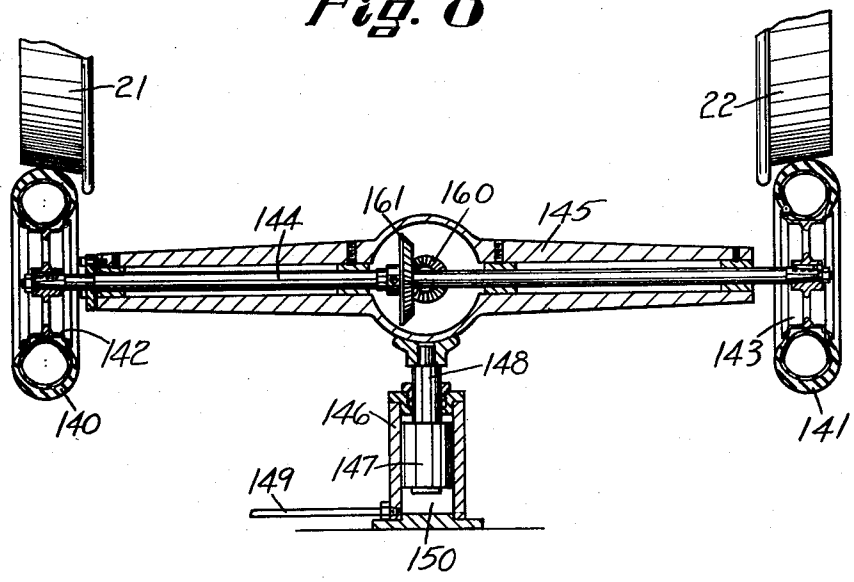
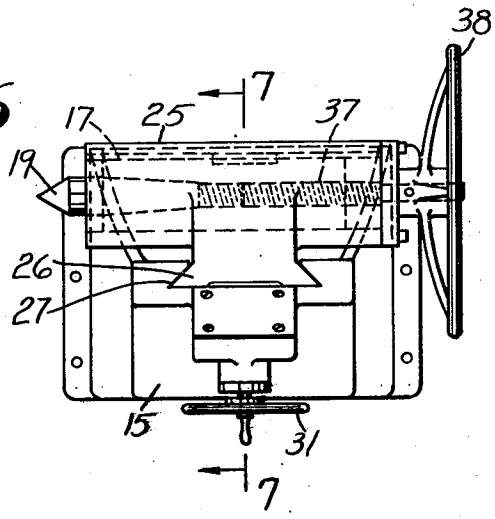


Fig. 6



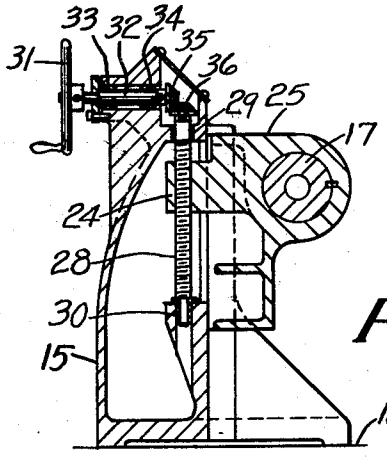


Fig. 7

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CAR WHEEL GRINDING MACHINE

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Fig. 10

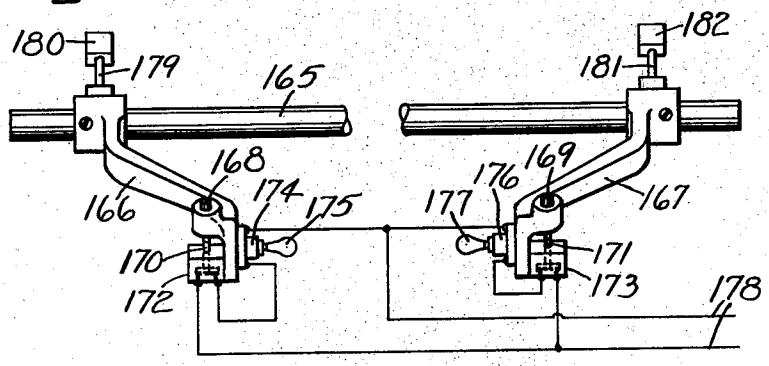
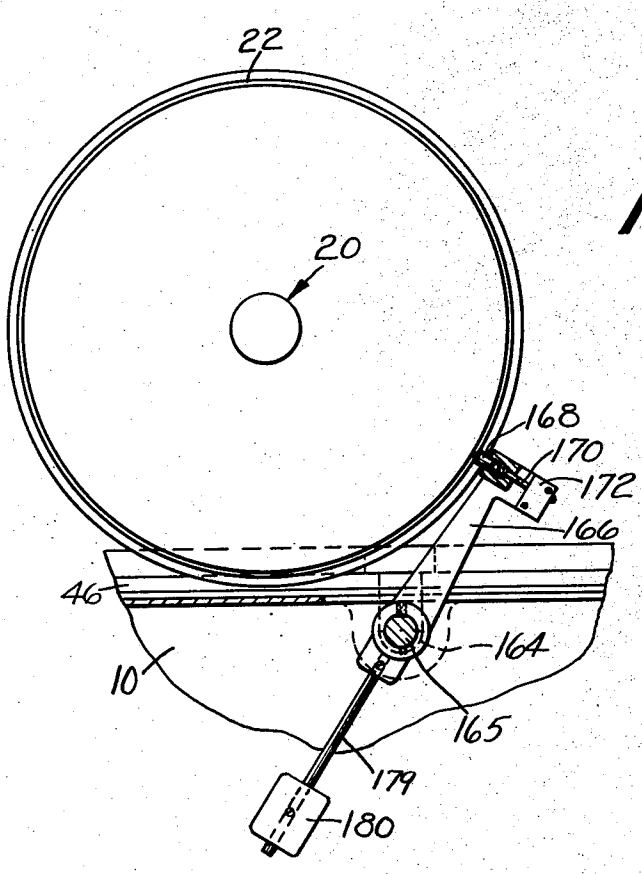


Fig. 9



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UNITED STATES PATENT OFFICE

2,605,591

CAR WHEEL GRINDING MACHINE

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Application April 26, 1950, Serial No. 158,244

5 Claims. (Cl. 51—104)

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The invention relates to grinding machines, and more particularly to a car wheel grinding machine for simultaneously grinding a pair of spaced car wheels on a car wheel assembly.

One object of the invention is to provide a simple and thoroughly practical car wheel grinding machine for grinding a pair of spaced car wheels. Another object of the invention is to provide a car wheel grinding machine having a pair of spaced grinding wheels arranged vertically above the car wheels to be ground whereby a pair of car wheels may be simultaneously ground. Another object is to provide a pair of independent spaced vertically adjustable wheel slides which are supported on independent horizontally traversable carriages, said carriages being provided with swivel supports to facilitate grinding tapered surfaces on a pair of spaced car wheels.

A further object of the invention is to provide a car wheel grinding machine with spaced vertically arranged wheel slides for rotatable grinding wheels to engage the upper surface of a pair of spaced car wheels being ground which is arranged so as to eliminate the necessity of moving the grinding wheel slides through a relatively long positioning stroke before and after grinding. Another object is to provide a car wheel grinding machine for grinding a pair of spaced car wheels in which the car wheel assembly may be rolled into and out of the machine before and after grinding without the necessity of shifting the grinding wheel assemblies to and from operative positions. Another object of the invention is to provide an improved gauging apparatus whereby a pair of spaced car wheels may be readily ground to the same diameters.

Other objects will be in part obvious or in part pointed out hereinafter. The invention accordingly consists in the features of construction, combinations of elements and arrangements of parts as will be exemplified in the structure to be hereinafter described, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, in which is shown one of various possible embodiments of the mechanical features of this invention,

Fig. 1 is a front elevation of the improved car wheel grinding machine;

Fig. 2 is a plan view of the machine having parts broken away to more clearly illustrate the car wheel driving mechanism;

Fig. 3 is a right-hand end elevation of the machine, on an enlarged scale;

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Fig. 4 is a horizontal sectional view, on an enlarged scale, taken approximately on the line 4—4 of Fig. 1, through the grinding wheel traversing mechanism for the left-hand grinding wheel head;

Fig. 5 is a vertical sectional view, on an enlarged scale, taken approximately on the line 5—5 of Fig. 2, through the feeding mechanism for the left-hand grinding wheel head;

Fig. 6 is a plan view, on an enlarged scale, of the right-hand work head;

Fig. 7 is a vertical section taken approximately on the line 7—7 of Fig. 6, through the right-hand work head;

Fig. 8 is a vertical sectional view, on an enlarged scale, through the car wheel driving mechanism;

Fig. 9 is a fragmentary vertical section view, on an enlarged scale, taken approximately on the line 9—9 of Fig. 1, showing the gauging device for the right-hand car wheel; and

Fig. 10 is a fragmentary diagrammatic view of the car wheel gauging apparatus.

A car wheel grinding machine has been illustrated in the drawings having a base 10 which is set within a concrete foundation 11 so that the top surface 12 of the base 10 is substantially on the same level as the floor level 13 (see Fig. 1). The base 10 serves as a support for a pair of spaced work heads 14 and 15 which are provided with longitudinally adjustable work spindles 16 and 17 respectively. The work spindles 16 and 17 are in turn provided with work engaging and supporting centers 18 and 19 respectively for supporting a car wheel axle assembly 20 having a pair of spaced car wheels 21 and 22 fixedly mounted thereon.

In order to facilitate supporting a car wheel assembly 20 on the centers 18 and 19 so that the car wheels 21 and 22 are raised off their normal support, each of the work heads 14 and 15 are provided with a vertical adjustment to facilitate raising or lowering the centers 18 and 19 in setting up the machine. The adjustment of the two work heads is identical consequently only one of the adjusting mechanisms has been illustrated in detail. The work head 15 is provided with a vertically adjustable slide 25 for supporting the spindle 17 and the center 19. The slide 25 is provided with a vertically arranged dovetailed slideway 26 which mates with a vertically arranged dovetailed slideway 27 formed on the work head 15. In order to facilitate a vertical adjustment of the slide 25, a rotatable feed screw 28 is rotatably mounted in spaced bearings 29 and 30

carried by the work head 15. The feed screw 28 meshes with a nut 24 formed integral with the slide 25 (Fig. 7). A hand wheel 31 is provided to facilitate manual operation of the feed screw 28. The hand wheel 31 is mounted on the outer end of a rotatable shaft 32 which is journalled in spaced bearings 33 and 34 mounted within the work head 15. A bevel gear 35 is mounted on the inner end of the shaft 32 and meshes with a bevel gear 36 mounted on the upper end of the screw 28. It will be readily apparent from the foregoing disclosure that rotary motion of the hand wheel 31 will be transmitted to cause a vertical movement of the slide 25 together with the spindle 17 and the work center 19.

In order to facilitate longitudinal adjustment of the spindle 17 and center 19 relative to the work head 15, a rotatably mounted adjusting screw 37 is carried by the vertical slide 25. The screw 37 meshes with a threaded aperture formed within an axial bore within the spindle 17. A manually operable hand wheel 38 is fixedly mounted on the right-hand end of the screw 37 to facilitate rotation of the screw 37 and thereby to facilitate a longitudinal adjustment of the spindle 17.

The work head 14 is similarly provided with a vertical slide 40 (Fig. 2) which supports the spindle 16 and the center 18. The vertical slide 40 is provided with a vertically arranged dovetailed slideway 41 which mates with a dovetailed slideway 42 formed on the work head 14. A manually operable hand wheel 43 is provided for vertically adjusting the slide 40 relative to the work head 14 in the same manner as that shown in connection with the work head 15. Similarly a hand wheel 44 is provided for causing a longitudinal adjustment of the spindle 16 and center 18.

A pair of spaced angle tracks 45 and 46 is provided for engaging the flanged rim of the spaced car wheels for the purpose of guiding the wheels through the machine. These rails are continuous rails running from the front to back of the machine and are arranged so that they do not interfere with the car wheel driving mechanism to be hereinafter described.

The car axle assembly 20 having a pair of spaced grinding wheels 21 and 22 to be ground is rolled into the machine on the rails 45 and 46 until the axle of the assembly is aligned with the work centers 18 and 19. The hand wheels 38 and 44 are then rotated to move the spindles 16 and 17 toward each other so that the centers 18 and 19 engage the center holes on opposite ends of the assembly and raise the assembly 20 a slight amount so that the flanges of the wheels 21 and 22 are raised off the rails 45 and 46. The slides 25 and 40 may be adjusted vertically to position the centers 18 and 19 as desired. If preferred the slides 25 and 40 may be lowered until the centers 18 and 19 are aligned with the center holes in the assembly 20 when the assembly is resting on the rails 45 and 46. The centers 18 and 19 may then be moved into engagement with the center holes after which the hand wheels 31 and 43 may be rotated to raise the slides 25 and 40 so as to lift the car wheel assembly off the rails 45 and 46.

In the preferred construction a pair of spaced grinding wheel assemblies are provided which are arranged vertically above the car wheel assembly so that the operative faces of the wheels engage the upper surfaces of the car wheels being ground so that no appreciable movement of the wheel

heads is required after a grinding operation before the assembly may be rolled out of the machine. As illustrated in the drawings the base 10 is provided with a vertically arranged column 50 which supports a horizontally arranged member 51 having a horizontally arranged dovetailed slideway 52. A horizontal slide or carriage 53 is provided having dovetailed ways mating with the dovetailed ways 52. The horizontal slide 53 is provided with a vertically arranged dovetailed slideway 54 which mates with correspondingly shaped dovetailed ways formed on a vertically arranged wheel slide 55. The wheel slide 55 is provided with a rotatable wheel spindle 56 having a grinding wheel 57 at the left-hand end thereof (Fig. 1). A suitable driving mechanism is provided for the wheel spindle 56 comprising an electric motor 58 which is mounted on a vertically adjustable motor base 59. The motor base 59 is provided with a dovetailed slideway 60. An adjusting screw 61 supported by a bracket 62 is fixedly mounted on the wheel slide 55. The adjusting screw 61 is screw threaded into the motor base 59. It will be readily apparent from the foregoing disclosure that by adjustment of the screw 61, the motor 58 and motor base 59 may be adjusted vertically for tensioning the driving belts to be hereinafter described. The motor 58 is provided with a multiple V-groove pulley 63 which is connected by multiple V-belts 64 with a multiple V-groove pulley 65 mounted on the right-hand end of the wheel spindle 56.

In order to facilitate grinding a tapered peripheral surface on a car wheel, a horizontal member is preferably supported so that it may be swivelled relative to the column 50 so as to adjust the path of movement of the horizontal slide 53. The horizontal member 51 is supported by a pivot stud 68 carried by the column 50. A stud 69 projects rearwardly from the left-hand end of the member 51. The column 50 is provided with a pair of spaced projected lugs 70 and 71 which are provided with opposed adjusting screws 72 and 73 respectively. The adjusting screws 72 and 73 are aligned with the stud 69 and are arranged to facilitate a precise pivotal adjustment of the horizontal member 51. A hand wheel 74 is provided for manually adjusting the wheel slide 55 in a vertical direction by means of a mechanism to be hereinafter described. Similarly a hand wheel 75 is provided for traversing the horizontal slide 53 to traverse the grinding wheel 57 relative to the car wheel face being ground. The column 50 is provided with laterally projected lugs 76 and 77. The horizontally arranged member 51 is provided with a pair of spaced clamping and guide blocks 78 and 79 respectively which co-operate with the lugs 76 and 77 to guide the horizontal member 51 during its pivotal adjustment and may if desired be utilized to clamp the horizontal member 51 in adjusted position.

Similarly, the base 10 is provided with a vertical column 80 which supports a horizontally arranged member 81. The member 81 is provided with a horizontally arranged dovetailed slideway 82 which supports a horizontally movable slide or carriage 83. The carriage 83 is provided with a vertically arranged dovetailed slideway 84 which mates with a correspondingly shaped way formed on a vertically movable wheel slide 85. The wheel slide 85 is provided with a wheel spindle 86 having a grinding wheel 87 mounted on the right-hand end thereof (Fig. 1). The grinding wheel 87 may be driven by means of an electric motor 88 which is mounted on a

vertically adjustable motor base 89. The motor base 89 is provided with a dovetailed slideway 90 which mates with a correspondingly shaped way on the wheel slide 85. In order to facilitate adjustment of the motor 88 and the motor base 89, an adjusting screw 91 is provided which is rotatably supported by a bracket 92 which is in turn fixedly mounted on the upper surface of the wheel slide 85. The motor 88 is provided with a multiple V-groove pulley 93 which is connected by multiple V-belts 94 with a multiple V-groove pulley 95 mounted on the left-hand end of the wheel spindle 86 (Fig. 1).

The horizontally arranged member 81 is connected by a pivotally mounted stud 98 with the column 80. A stud 99 projects rearwardly from the right-hand end of the member 81 between a pair of spaced lugs 100 which are formed integral with column 80. Opposed adjusting screws 102 are provided on the lugs 100 to facilitate a pivotal adjustment of the horizontal member 81 to adjust the path of movement of the horizontal slide 83. A manually operable hand wheel 104 is provided for adjusting the wheel slide 85 vertically in a manner to be hereinafter described. Similarly a manually operable hand wheel 105 is provided for traversing the horizontally arranged carriage 83 to facilitate traversing the grinding wheel 87 relative to the car wheel 21 being ground. The column 80 is provided with a pair of laterally extending lugs 106 and 107 (Fig. 2) which co-operate with a pair of guiding and clamping blocks 108 and 109 respectively which are mounted on the horizontally arranged member 81. The blocks 108 and 109 serve to hold the horizontally arranged member 81 in position relative to the column 80 and if desired may be utilized to clamp the member 81 in adjusted position relative to the column 80.

The feeding mechanisms for the wheel slides 55 and 85 are identical in construction, consequently only one of these mechanisms have been illustrated in detail. Similarly identical traversing mechanisms are provided for traversing the horizontal slides 53 and 83. Consequently only one of these mechanisms has been illustrated in detail.

As shown in Fig. 4, a feed screw 115 is fixedly mounted within the horizontally arranged member 81. The feed screw 115 meshes with a nut 116 which is rotatably supported in anti-friction bearings carried by a rearwardly projected portion of the horizontal slide 83. A bevel gear 117 is formed integral with the nut 116 and meshes with a bevel gear 118 fixedly mounted on the end of a rotatable shaft 119. The shaft 119 is journalled in spaced bearings 120 and 121 supported within a housing 122 (Fig. 4). The hand wheel 105 is mounted on the outer end of the shaft 119, by means of which the nut 116 may be rotated in either direction to cause a longitudinal traversing movement of the horizontal slide 83. The mechanism for traversing the horizontal slide 53 is identical with that just described and consequently has not been illustrated in detail.

A suitable vertical feeding mechanism is provided for the wheel slide 85 comprising a feed screw 125 which is fixedly supported within the horizontally movable slide 83. The feed screw 125 meshes with a rotatable nut 126 which is journalled in anti-friction bearings carried by a rearwardly projected portion of the wheel slide 85. A bevel gear 127 is formed integral with the nut 126 and meshes with a bevel gear 128 mounted on the right-hand end of a rotatable shaft 129 (Fig. 5). The shaft 129 is supported by a pair of spaced bearings 130 and 131 which are in turn supported by a housing 132 fixedly mounted on and projected from the wheel slide 85.

A friction type driving mechanism is provided for rotating the car wheel axle assembly 20. This mechanism may comprise a pair of spaced pneumatic tires 140 and 141 which are positioned and arranged to frictionally engage the peripheral surface of the car wheels 21 and 22 respectively. The tires 140 and 141 are mounted on a pair of spaced wheels 142 and 143 respectively which are in turn supported on a shaft 144 (Fig. 8). The shaft 144 is journalled in bearings within a housing 145.

A fluid pressure operated mechanism is provided for moving the housing 145 together with the tires 140 and 141 into frictional driving engagement with car wheels 21 and 22 respectively. This mechanism may comprise an identical cylinder 146 having a slidably mounted piston 147 which is formed on the lower end of a piston rod 148. The upper end of the piston rod 148 is loosely connected to the housing 145. When fluid under pressure is admitted through a pipe 149 into a cylinder chamber 150, the piston 147 is moved upwardly together with the housing 145 to move the tires 140 and 141 into operative driving engagement with the wheels 21 and 22 respectively. Such pressure is provided to the cylinder chamber 150 so that the tires are flexed at the point of driving contact so that a substantial area of the tire surface is in frictional engagement with the car wheel. A suitable driving mechanism is provided for rotating the shaft 144 such as for example an electric motor 151 which is mounted within the base 10 of the machine. The motor 151 is provided with a multiple V-groove pulley 152 which is connected by multiple V-belts 153 with a multiple V-groove pulley 154 which is mounted on a drive shaft 155 of a speed reducer unit 156. The speed reducer unit 156 may be of any of the standard well known commercial speed reducers. The driven shaft 157 of the speed reducer unit 156 is connected by a universal joint 158 with a shaft 159 (Fig. 2). The shaft 159 serves as a support for a bevel gear 160 which meshes with a bevel gear 161 mounted on the shaft 144. It will be readily apparent from the foregoing disclosure that when fluid is admitted to the cylinder chamber 150, the tires are raised into driving engagement with the car wheels 21 and 22 so that the motor 151 is started. A rotary motion will be imparted through the driving mechanism above described to rotate the shaft 144, the wheels 142 and 143 and the tires 140 and 141 to impart a rotary motion to the car wheels 21 and 22 for a grinding operation.

In the grinding or regrinding of car wheel assemblies it is desirable to true up the periphery of the car wheel and also to true up the pair of wheels to the same diameters. In order to facilitate grinding the car wheels 21 and 22 to the same diameters, a suitable gauging apparatus is provided. This apparatus may comprise a rock shaft 165 which is journalled in bearings 164 in the base 10 of the machine. A pair of spaced gauging arms 166 and 167 are fixedly mounted on the rock shaft 165 and are arranged to swing toward and from the periphery of the car wheels to be ground. The arms 166 and 167 are provided with spring pressed car engaging elements 168 and 169 respectively which are arranged to engage actuating plungers 170 and 171 respectively of a

pair of normally open limit switches 172 and 173 respectively. The limit switch 172 is connected to an electric light socket 174 which supports a light bulb 175. Similarly the limit switch 173 is connected to a light socket 176 which supports a light bulb 177. Power is supplied from the power lines 178 to the limit switches 172 and 173 and to the sockets 174 and 176 so that when the limit switch 172 or the limit switch 173 is closed, the light bulb 175 or the light bulb 177 will be illuminated.

In order to facilitate maintaining the gauging arms 166 and 167 in an operative position, a suitable counter-balance mechanism is provided. A rod 179 supporting an adjustably mounted counter-balance weight 180 is supported in fixed relationship with the gauging arm 166 so that it tends to rock the arm 166 in a counter-clockwise direction (Fig. 9) to maintain the contact plunger 168 either in engagement with the car wheel 22 or in close proximity thereto. Similarly the arm 167 is provided with a rod 181 supporting an adjustably mounted counter-balance weight 182. Both of the arms 166 and 167 being fixed to the shaft 165, the effect of the counter-balance weights 180 and 182 serves to simultaneously maintain both of the gauging arms 166 and 167 in operative positions. When a grinding operation is started, the weights 180 and 182 are free to swing the gauging arms 166 and 167 into operative relation with the periphery of the car wheels 21 and 22 respectively. It will be readily appreciated from the foregoing disclosure that one or both of the lights 175 and 177 will be illuminated. If both of the car wheels to be ground are of the same diameter then both of the lights will be illuminated. If the car wheel 21 is slightly larger in diameter, the plunger 168 will engage the periphery of the car wheel 21 thereby closing the limit switch 172 and illuminating the light bulb 175. The car wheel 22 being slightly smaller in diameter, the plunger 169 will remain slightly out of engagement with the periphery of the car wheel 22 or it may contact the car wheel 22 but insufficient movement of the contact member 169 is obtained to close the limit switch 173, consequently the light bulb 177 will not be illuminated. In the latter example, the operator starts grinding the car wheel 21 by manipulation of the feed wheel 104 and the traverse wheel 105. This grinding operation is continued until the periphery of the car wheel 21 is reduced sufficiently in diameter so that the contact member 169 engages the periphery of the car wheel 22 so as to close the limit switch 173 and illuminate the light bulb 177, thus indicating that both of the car wheels 21 and 22 are of the same diameter.

If desired, the car wheel 22 being of a slightly smaller diameter than the car wheel 21, the grinding operation may be initiated on the car wheel 22 by manipulation of the feed wheel 74 and the traverse wheel 75 to true up the periphery of the car wheel 22. If this procedure is followed the light bulb 177 remains out during the truing up operation on the car wheel 22. After the periphery of the car wheel 22 has been trued up to the desired extent, the grinding wheel 87 may be manipulated by actuation of the feed wheel 104 and the traverse wheel 105 to true up the periphery of the car wheel 21. During this operation the light bulb 175 is illuminated. The grinding operation on the car wheel 21 is continued until the diameter thereof is reduced sufficiently so that the rocking movement of the shaft 165 and the gauging arm 167 will move the plunger 169 into engagement with the periphery of the car wheel 22 to close the limit switch 173 thereby illuminating the light bulb 177. When both of the light bulbs 175 and 177 are illuminated, both of the car wheels 21 and 22 are of the same diameter. The sequence of operation of the grinding wheels 57 and 87 may be varied as desired.

The operation of this improved car wheel grinding machine will be readily apparent from the foregoing disclosure. A car wheel axle assembly 20 is rolled into the machine on the rails 45 and 46 until the axis of the assembly 20 is in a vertical plane passing through the work supporting centers 18 and 19. The hand wheels 44 and 38 are then actuated to move the spindles 16 and 17 toward each other so that the work centers 18 and 19 move into engagement with center holes in the opposite ends of the car wheel axle assembly 20 and raise the assembly slightly off the rails 45 and 46. Fluid under pressure is then passed through the pipe 149 into the cylinder chamber 150 to raise the housing 145 thereby moving the pneumatic tires 140 and 141 into driving contact with the peripheries of the car wheels 21 and 22. The motor 151 is started to rotate the tires 140 and 141 in a manner above described to impart a rotary motion to the car wheel assembly 20. The motors 58 and 88 are then started to start rotation of the grinding wheels 57 and 87 after which the grinding operation may be initiated. The gauging arms 166 and 167 move in a counterclockwise direction until one or both of the plungers 168 and 169 engage the periphery of one or both of the car wheels 21 and 22. The grinding operation may then be performed in a manner above described by manipulation of the feed wheels 74 and 105 to grind true surfaces on the periphery of the car wheels 21 and 22 which are of the same diameter. It will be readily apparent from the foregoing disclosure that the horizontal members 51 and 81 may be swivelled about the pivot studs 68 and 98 in a manner above described to grind either a true cylindrical or a tapered surface on the periphery of the car wheels 21 and 22.

After both of the car wheels 21 and 22 have been ground to the predetermined extent, the grinding wheels 57 and 87 may be slightly backed off sufficiently so that the wheels 57 and 87 are out of contact with car wheels after which the work centers 18 and 19 may be withdrawn by manipulation of the hand wheels 44 and 38 so that the car wheel assembly 20 is lowered onto the rails 45 and 46 after which the car wheel assembly 20 may be rolled off the machine in either direction.

It will thus be seen that there has been provided by this invention apparatus in which the various objects hereinabove set forth together with many thoroughly practical advantages are successfully achieved. As many possible embodiments may be made of the above invention and as many changes might be made in the embodiment above set forth, it is to be understood that all matter hereinbefore set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

I claim:

1. In a grinding machine for grinding the treads of a pair of spaced car wheels assembled on their axle having a base, a pair of spaced work heads having aligned manually adjustable centers, a pair of spaced continuous rails to

facilitate rolling an assembly into alignment with the centers before grinding and out of the machine after grinding, means independently to adjust said centers vertically, said centers being arranged to engage center holes in opposite ends of said assembly to raise said assembly from said rails into a grinding position and rotatably to support the assembly for a grinding operation, a pair of spaced vertically extending columns on said base, a longitudinally traversable carriage on each of said columns, a vertically adjustable wheel slide on each of said carriages, a rotatable grinding wheel on each of said wheel slides, means including independent swivel connections between each of said carriages and its supporting column, and precise means including independent screw mechanisms to facilitate an angular adjustment of the path of movement of said carriages in a substantially vertical plane for grinding a predetermined taper on the car wheels being ground.

2. In a car wheel grinding machine, as claimed in claim 1, in combination with the parts and features therein specified of a car wheel gauging apparatus including a rock shaft which is arranged substantially parallel with the axis of the car wheel assembly being ground, a pair of spaced gauging arms fixedly mounted on said shaft, a spring-pressed plunger on each of said arms, an adjustable counter-balance for said shaft normally to maintain one or both of said plungers in engagement with the spaced car wheels being ground, an independent limit switch on each of said arms associated with each of said plungers, and an independent signal light connected with each of said switches, said gauge parts being arranged so that both of said signal lights are illuminated when the car wheels have been ground to the same diameters.

3. In a car wheel grinding machine, as claimed in claim 1, in combination with the parts and features therein specified in which each of the work heads is provided with a vertically adjustable slide, a horizontally adjustable center supporting spindle on each of said slides, a manually operable nut and screw mechanism to adjust said spindles longitudinally for moving the centers into supporting engagement with the car axle assembly, and means including an independent nut and screw mechanism to adjust each of said slides vertically to vary the height of said spindles and centers in setting up the machine for accommodating car wheels of different diameters.

4. In a car wheel grinding machine, as claimed in claim 1, in combination with the parts and features therein specified of a car wheel driving mechanism comprising a pair of spaced pneumatic wheels, a rotatable shaft therefor, a horizontally arranged vertically movable housing, spaced bearings therein for supporting said shaft, a drive for said shaft including an electric motor, a gear reducer driven thereby, driving connections between said reducer and the central portion of said shaft, and means including a piston and cylinder to support the central portion of said housing, said piston and cylinder being arranged to raise and lower said housing to move the pneumatic wheels into frictional driving engagement with the peripheries of said car wheels.

5. In a grinding machine for grinding the treads of a pair of spaced car wheels assembled on their axle having a base, a pair of spaced work heads having aligned manually adjustable centers, a pair of spaced continuous rails to facilitate rolling an assembly into and out of the machine before and after grinding, a pair of spaced vertically extending columns on said base, an adjustable vertically arranged plate on each of said columns, a horizontal pivot stud on each of said columns to support said plates, a horizontally traversable carriage on each of said plates, a vertically adjustable wheel slide on each of said carriages, a rotatable grinding wheel on each of said slides, means including an independent manually operable hand wheel to traverse each of said carriages longitudinally, means including an independent manually operable hand wheel to feed each of said wheel slides vertically to feed the grinding wheels toward and from the car wheels being ground, and precise means including opposed adjusting screws angularly to adjust said plates relative to said columns to facilitate adjustment of the path of travel of said carriages so as to grind predetermined tapers on said car wheels.

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