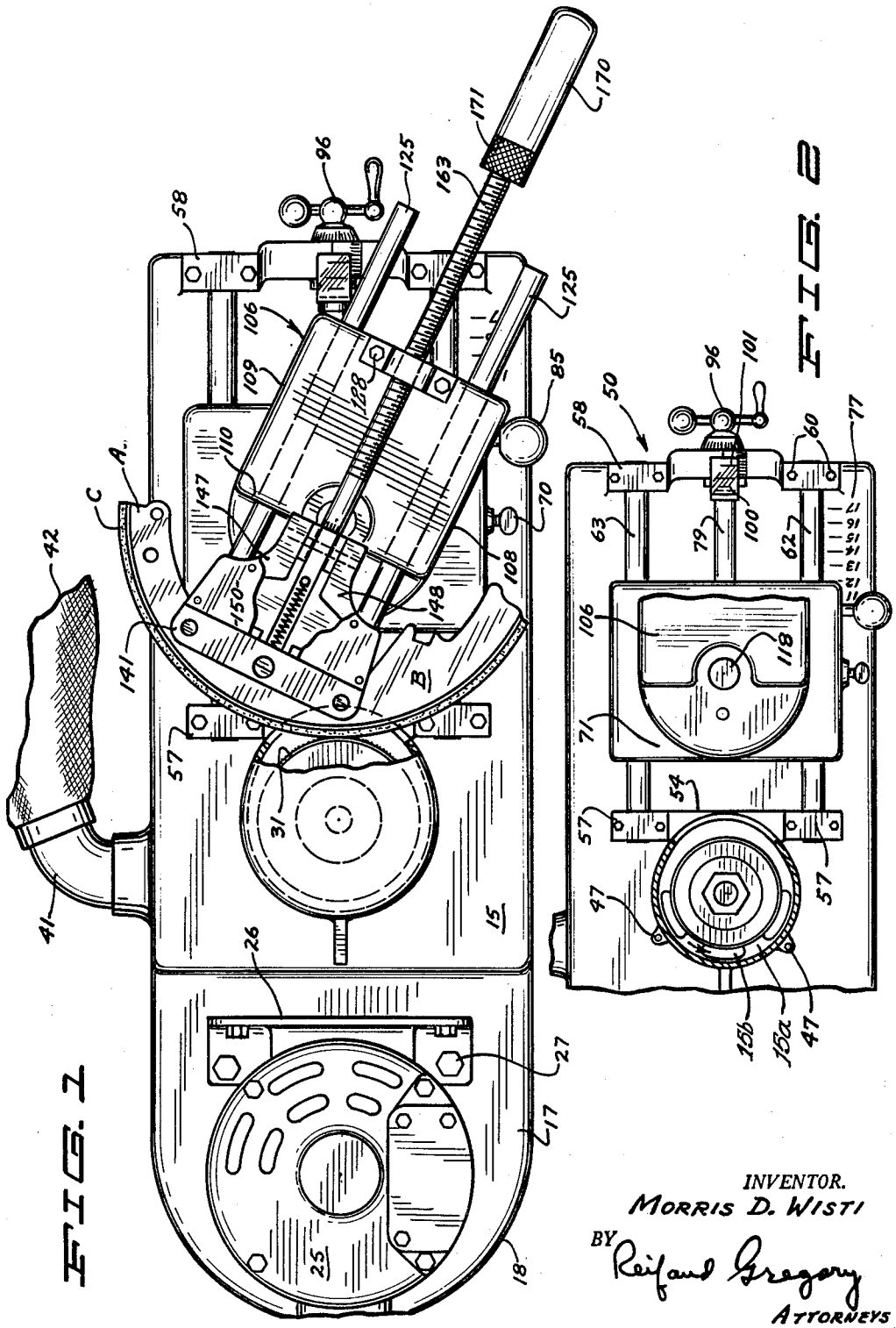
Oct. 30, 1962 M. D. WISTI 3,060,644

BRAKE SHOE GRINDING DEVICE

Filed April 27, 1960 5 Sheets-Sheet 1



Oct. 30, 1962 M. D. WISTI 3,060,644

BRAKE SHOE GRINDING DEVICE

Filed April 27, 1960 5 Sheets-Sheet 2

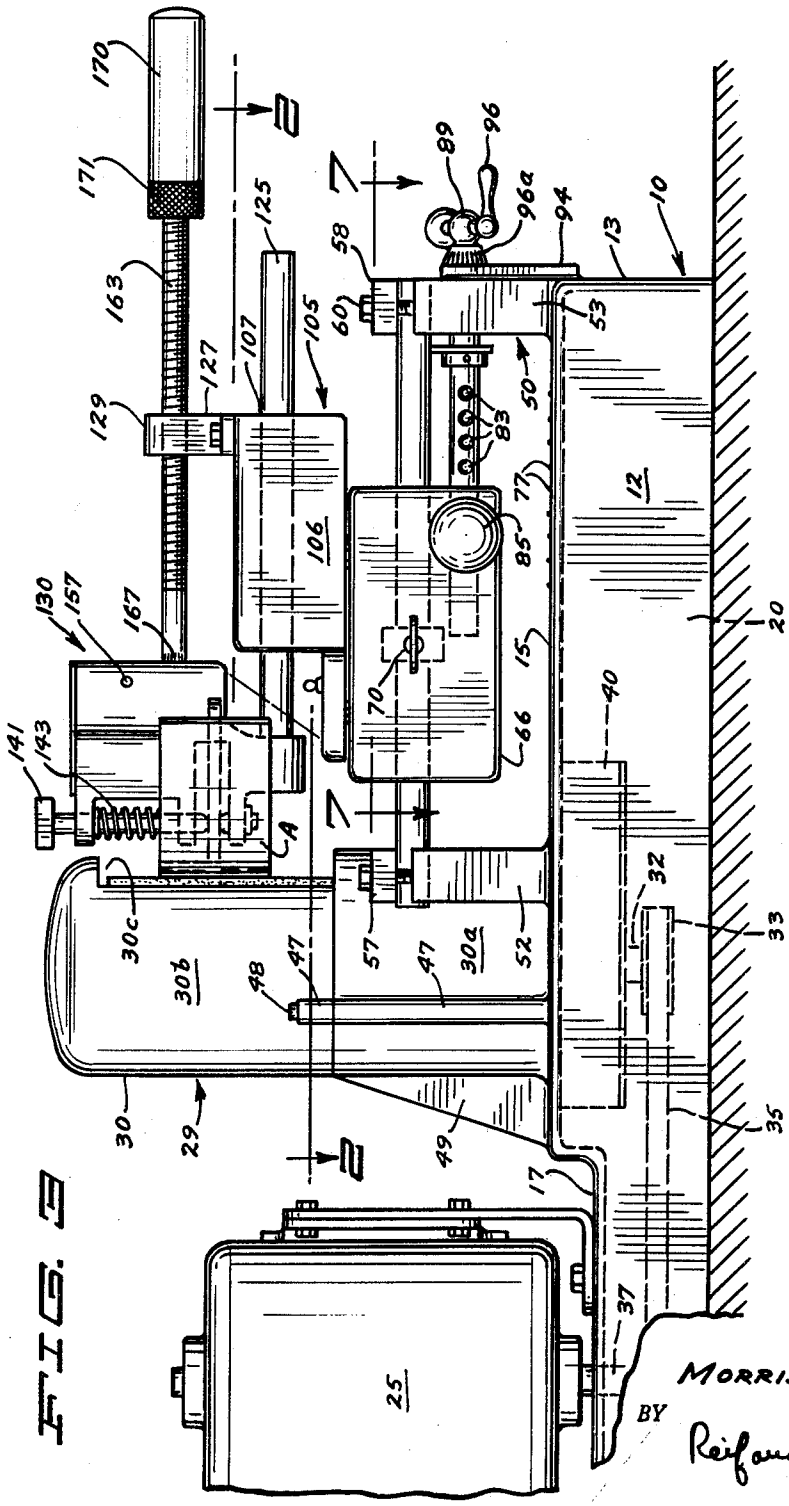


FIG. 3

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BRAKE SHOE GRINDING DEVICE

Filed April 27, 1960 5 Sheets-Sheet 3

FIG. 4

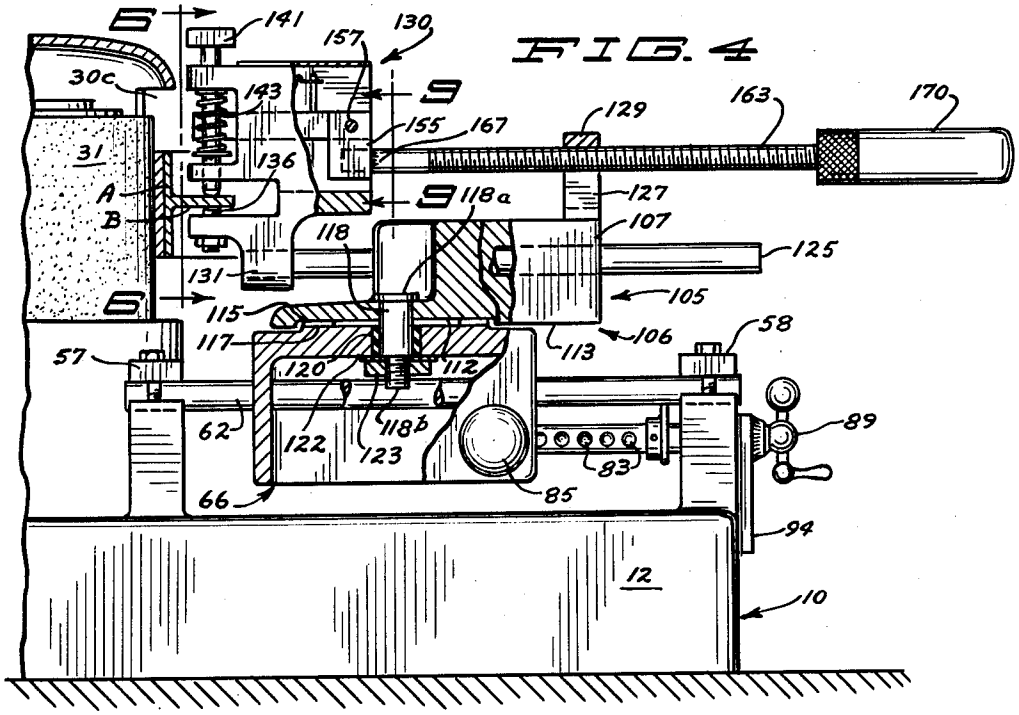


FIG. 5

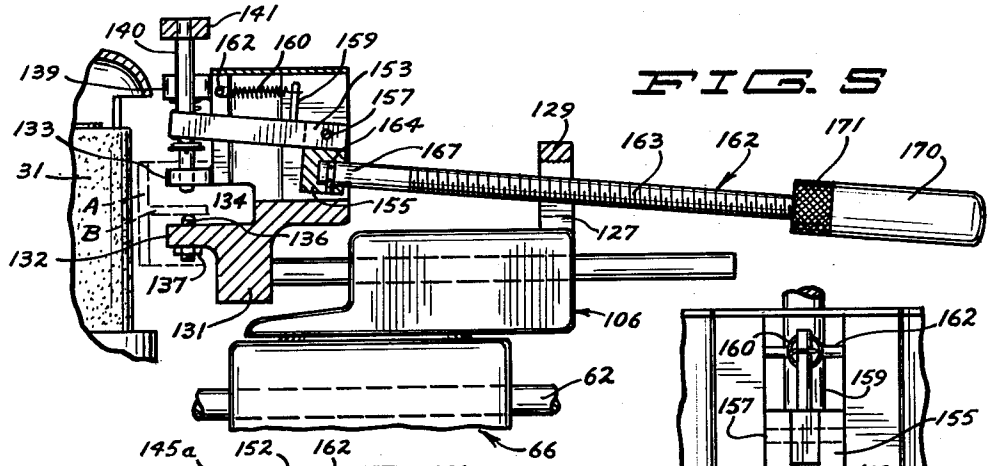


FIG. 6

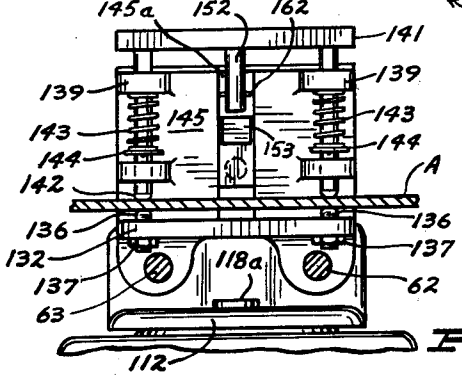


FIG. 9

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Oct. 30, 1962 M. D. WISTI 3,060,644

BRAKE SHOE GRINDING DEVICE

Filed April 27, 1960 5 Sheets-Sheet 4

FIG. 7

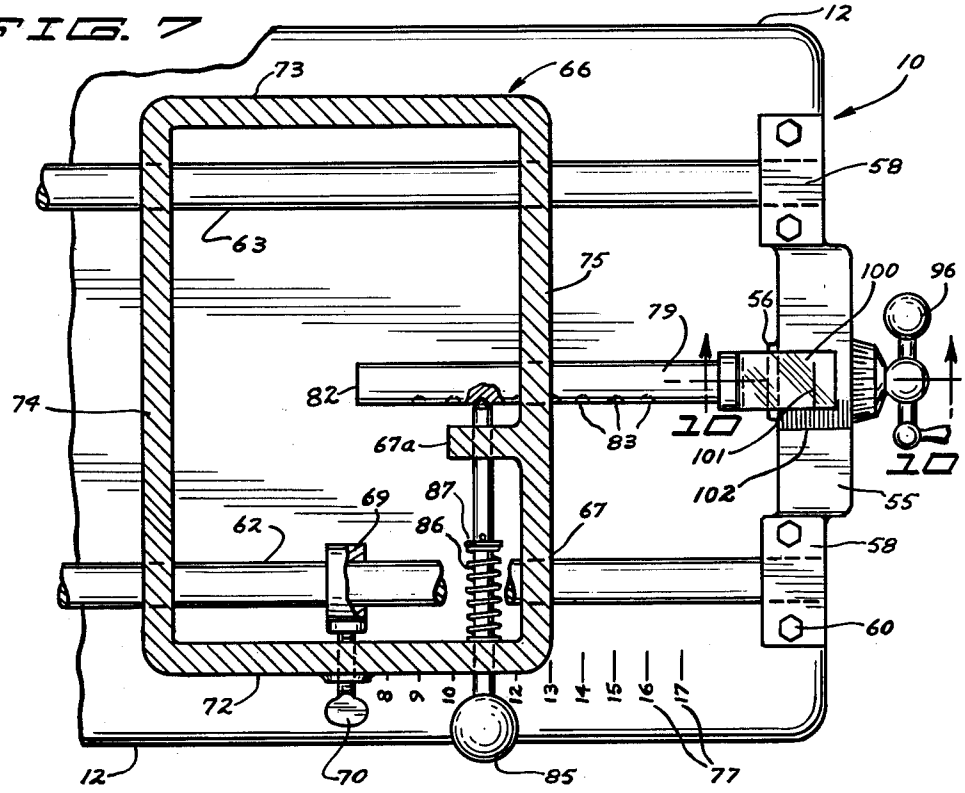
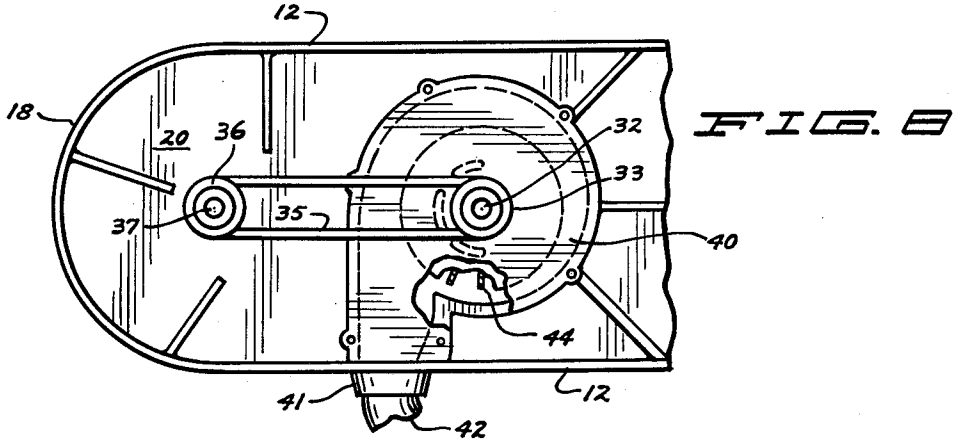


FIG. 8



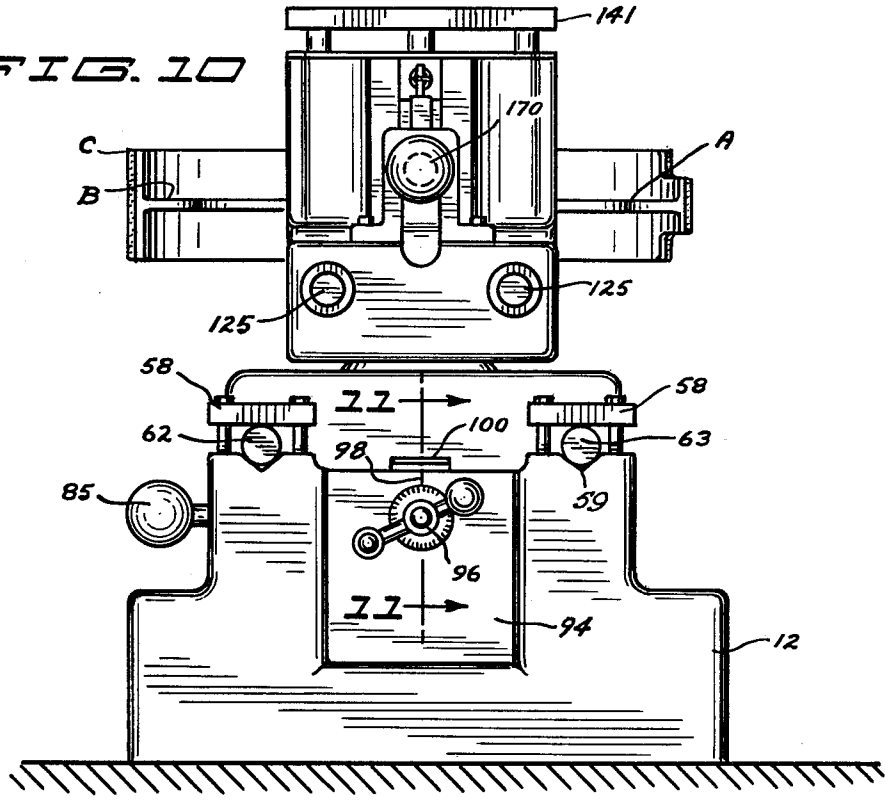
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BRAKE SHOE GRINDING DEVICE

Filed April 27, 1960 5 Sheets-Sheet 5

FIG. 10



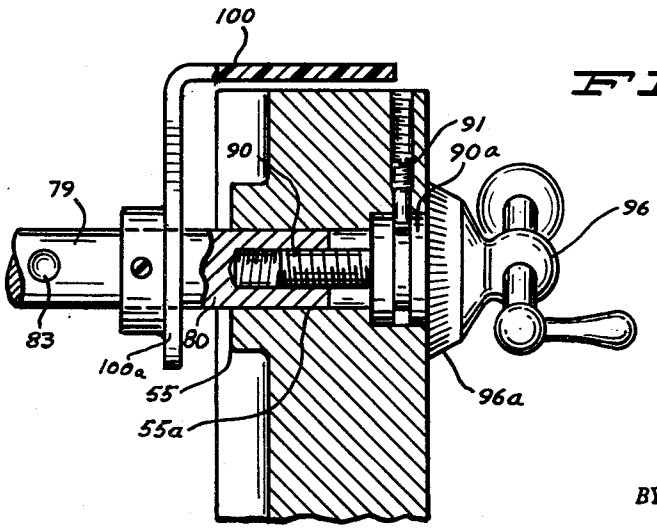


FIG. 11

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United States Patent Office 3,060,644 Patented Oct. 30, 1962

3,060,644

BRAKE SHOE GRINDING DEVICE

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Filed Apr. 27, 1960, Ser. No. 25,103
5 Claims. (Cl. 51—96)

This invention relates to a brake shoe grinding device adapted to grind accurately an arcuate surface. The function of this device is to provide to a selected dimension a somewhat even wearing surface on the lining of a brake shoe to obtain a substantially perfect braking engagement between the shoe and its mating drum surface.

More particularly this invention relates to an improvement providing for a quicker and more efficient operation of such a device. Essential elements of such a device comprise a clamping member to hold the brake shoe with lining in a grinding position, and means for adjusting or fixing accurately the path of travel of said shoe and lining in relation to the grinding means. To applicant's knowledge, clamping members generally in use require the use of both hands of the operator in securing or releasing the brake shoe relative to the clamping member. For this purpose the operator must remove one of his hands from its otherwise operating position of directing the brake shoe through the grinding operation. In applicant's device this is not necessary as the member which guides the brake shoe and its lining through the grinding operation is the same member which operates the clamp to grip or release a brake shoe, and the operator's hand on this member is retained in position. A specific operating motion is thus saved in the use of the applicant's device.

Further an initial major adjustment is generally necessary in a brake shoe grinding device and on machines commonly used, both hands of the operator are required for this purpose. In the operation of applicant's device, the use of only one hand is required for making this primary or major adjustment and the other hand of the operator remains in its normal operating position as above indicated. Thus there is a considerable time saving and improved efficiency in the operation of applicant's device. Other novel features of applicant's device will also hereinafter be disclosed.

It is an object therefore of this invention to provide a brake shoe grinding device adapted for an unusually fast and efficient operation.

It is another object of this invention to provide a brake shoe grinding device having a control means for operating the clamping member thereof without the operator being required to disturb from its normal operating position the hand used for the grinding of the brake shoe operation.

It is a further object of this invention to provide a brake shoe grinding device having means adapted for having a major adjustment made by the use of the one hand of the operator which is not otherwise used in directing the device through its grinding operation.

It is a still further object of this invention to provide a brake shoe grinding device having a unitary control member for operating the clamping member, for making a secondary adjustment, and for controlling the grinding operation with but the use of only one hand of the operator, and thus leaving the other hand free for quickly inserting brake shoes into and removing the same from the clamping member and for making major adjustments in the device at such times as required.

It is a more specific object of this invention to provide a brake shoe grinding device comprising a unitary member for operating the clamping member and being adapted also for providing a secondary adjustment of said clamping member to have it describe a path in accordance with a selected dimension for the desired grinding of a brake shoe lining, means for normally holding said clamping member in a closed or locking position, and means in connection with said unitary member to prevent inadvertent adjustment of the clamping member while in grinding operation, and further providing for a major adjustment of the device by the hand of the operator not otherwise used for the operation of the device. Thus the hand used by the operator in controlling the device through its operating or grinding cycle need never be removed from its operating position.

These and other objects and advantages of the invention will be fully set forth in the following description made in connection with the accompanying drawings in which like reference characters refer to similar parts throughout the several views and in which:

FIG. 1 is a top plan view of the applicant's device showing it in operating position;

FIG. 2 is a fragmentary view on a reduced scale in horizontal section taken on line 2—2 of FIG. 3 as indicated by the arrows;

FIG. 3 is a view of applicant's device in side elevation with some portions thereof shown in dotted line;

FIG. 4 is a fragmentary view similar to a portion of FIG. 3 in side elevation with some portions broken away to show details thereof;

FIG. 5 is a fragmentary view similar to a portion of FIG. 4 showing applicant's device in an alternate operating position;

FIG. 6 is a fragmentary view in elevation taken on line 6—6 of FIG. 4 as indicated by the arrows with a portion thereof shown in section;

FIG. 7 is a fragmentary view in horizontal section on an enlarged scale taken on line 7—7 of FIG. 3 as indicated by the arrows;

FIG. 8 is a fragmentary bottom plan view with a portion thereof broken away to show a detail of construction;

FIG. 9 is a fragmentary view on an enlarged scale in partial vertical section taken on line 9—9 of FIG. 4, as indicated by the arrows;

FIG. 10 is a view in end elevation; and

FIG. 11 is a fragmentary view on an enlarged scale in vertical section taken on line 11—11 of FIG. 10, as indicated by the arrows.

Referring to the drawings, applicant's device is shown comprising a base member 10 having a major body portion substantially parallelepiped in form being enclosed by sides 12, an end 13, a top surface 15, and having an offset surface portion 17 at the other end thereof with said offset portion having a curved wall 18 therearound merging with said sides 12 and with said member having a chamber 20 formed therein.

Mounted on said offset portion 17 and upstanding therefrom is a driving means 25 here shown in the form of a suitable electrical motor which will be connected to a suitable source of electrical current and is secured in position by a bracket 26 with bolts 27.

Mounted on said surface 15 adjacent said motor 25 is a grinding means 29 comprising an upstanding housing 30 having suitably mounted therein a cylindrical grinding member 31 and having extending therebelow within said chamber 20 a shaft 32 carrying a pulley 33 connected by means of a belt 35 to a driving pulley 36 which will be connected to the driving shaft 37 of said motor 25.

Mounted within said chamber 20 in vertical alignment with said housing 30 is a fan housing 40 having an outlet 41 having an exhaust hose 42 extending therefrom to the atmosphere. Suitably mounted within said housing 40 on said shaft 32 is a fan 44.

Said housing 30 is here indicated as being formed having its lower portion 30*a* integral with said surface por-

tion 15 and having its bottom formed by portion 15*a* of said surface 15 and having spaced therein arcuate slots 15*b*. The upper portion 30*b* of said housing is removable and has a grinding opening 30*c* therein. Said upper portion of said housing is secured to the lower portion thereof by mating portions of external elongated bosses 47 secured together by screws 48. A vertically disposed web 49 is provided as indicated in FIG. 3 for adding rigidity.

Secured to the top surface 15 is a supporting frame 50 comprising a pair of transversely extending longitudinally spaced upstanding brackets 52 and 53. Said brackets respectively have downwardly recessed central portions 54 and 55. Formed in the raised portions of said brackets are substantially V-shaped longitudinally extending grooves 59 respectively having cap portions 57 and 58 secured to said raised portions by bolts 60. Extending between said brackets are transversely spaced rods 62 and 63 having their ends respectively secured within said grooves. Said bracket 52 is located adjacent said grinding means 29, and in the embodiment of the invention as here shown, the recessed portion thereof is provided with an inwardly extending recessed portion to accommodate the adjacent portion of the housing 30, as indicated in FIG. 2.

Adapted to be movably supported by said rods 62 and 63 is a carriage 66 having said rods extend therethrough, as indicated in FIG. 2. With reference to FIG. 7, a collar 69 is disposed about said rod 62 with a wing headed bolt 70 being disposed through the side 72 of said carriage and threaded through said collar to frictionally engage said rod 62 to form a locking means to secure said carriage in any certain position longitudinally of said rods 62 and 63. Said carriage is here shown as a shell substantially parallelepiped in form having an open bottom and having a top wall 71, side walls 72 and 73, a front wall 74 and a rear wall 75.

Appearing on said surface 15 in the line of travel of the side 72 is indicia 77 comprising the numerals as here shown from 8 through 17. Said numerals have reference to the common diametral dimensions of brake drums. These are used for reference in the first major adjustment made in the operation of applicant's device. The indicia indicates intervals of one inch in the diameter of a brake drum. Disposed centrally longitudinally of said rods 62 and 63 and somewhat therebelow is a rod 79 having one end 80 disposed into a bore 55*a* of said central bracket portion 55 and extending outwardly through the side 75 of said carriage 66. Said rod end 80 is supported by a boss 56 secured on the inner side of said bracket portion. The free end 82 of said rod 79 thus extends into said carriage 66. Spaced along one side of said rod 79 and into respective alignment with said indicia 77 are detents 83. Said detents will be preferably formed to have conical inner end portions.

Disposed through said side 72 of said carriage 66 and through an inwardly extending web portion 67*a* is a wing headed pin 85 loaded with a spring 86 having one end bearing against the inner surface of said side 72 and having its other end engaged by a key held washer 87 on the barrel portion of said pin 85. The inner end of said pin 85 will be cone-shaped to fit accurately into the detents 83. It is seen that said pin is normally urged to be in engagement with said rod 79.

Said end portion 80 of said rod 79 is tapped to have a female thread extend longitudinally thereinto. Adapted to be threaded into said end 80 is a lead screw 90 disposed through said bracket 53 and rotatably locked in a longitudinally stationary position by a slotted collar 90*a* integral therewith and engaged by a locking pin 91 threaded into the boss 94 which is integral with the outer end portion of said bracket 53 as indicated in FIG. 11. Said screw 90 extends outwardly to have its outer end portion terminate in and be integral with a handle 96. Mounted on said lead screw 90 between said handle 96 and said boss 94 is a dial 96*a* calibrated to have its markings indicate thousandths of an inch whereby one revolution of said lead screw 90 will move said rod 70 longitudinally .50 inch. A reference line 98 appears on the top portion of said boss 94.

Referring to FIGS. 7 and 11, a flat plate member 100 is provided having a depending leg portion 100*a* secured to rod 79 to move integrally therewith and having a reference line 101 having in association therewith line markings 102 on the upper surface of the adjacent bracket portion 55 to indicate the number of revolutions said lead screw 90 may have been rotated.

Referring to FIG. 4, swingably mounted on said carriage 66 is a turret structure 105 having a body portion 106 substantially parallelepiped in form having a rear end 107, sides 108 and 109, a front end 110, and extending forwardly of said front end 110 is an offset substantially semi-circular portion 115 plate-like in form as to thickness. At the underside 113 of said member 106 is a recessed portion 112. Mounted on said upper surface 71 to support said turret structure 105 at said recessed portion 112 is a ring-like anti-friction thrust bearing 117. Vertically disposed through the top of said carriage member 66 is a pin 118 having an enlarged head portion 118*a*. Said pin is secured to said turret structure and is journaled in a sleeve bearing 120 disposed in said carriage 66. Said pin 118 extends through said carriage 66 and has a threaded lower end portion 118*b* of reduced dimension held in position by a washer 122 and a lock nut 123.

Slidably disposed through said member 106 is a pair of transversely spaced bars 125 which will be disposed in a plane parallel to the plane of said bars 62 and 63.

Upstanding from adjacent the end portion 107 of said member 106 is an inverted U-shaped bracket 127 which is secured by bolts 128 and which has a threaded portion 129 at its inner upper end to form in effect a half nut at said end portion.

Mounted on said rods 125 on their ends adjacent said grinding mechanism 29 is a clamping mechanism 130. Said clamping mechanism is irregularly formed and in the embodiment of the invention here presented comprises a depending stem-like portion 131 of reduced thickness within which end portions of said rods 125 are anchored. Extending forwardly of said stem portion 131 is a lower jaw 132 having spaced thereabove an upper jaw 133 with a substantially deep slot 134 of sufficient height formed therebetween. Said slot will be of a height to receive therein the flange portions B of brake shoes A.

Vertically disposed through said lower jaw 132 in transversely spaced relation are pins 136 having rounded head portions extending above the upper surface of said jaw portion and being suitably secured by having shank portions of reduced diameter secured by locking nuts 137. Said clamping mechanism structure above said lower jaw 132 is somewhat rectangular in horizontal section having extending forwardly above said upper jaw portion 133 spaced flange portions 139.

Vertically disposed through said flange portions 139 and through said upper jaw 133 in vertical alignment with said pins 136 are elongated pins 140 here shown having secured thereto and extending therebetween a strap-like cap member 141 which is secured to the upper end portions of said pins, and said pins have lower rounded end portions 142. Said pins 140 are respectively loaded with coiled springs 143 bearing at one end against the under surface of flanges 139 and bearing at their other ends against pin secured washers 144 whereby said pins will be normally urged in a downward direction into contact with said pins 136.

Said upper jaw 133 and flanges 139 extend forwardly from a front wall portion 145. Said clamping mechanism 130 has rearwardly converging side walls 147 and 148 of some thickness and are spaced apart at their rearward end portions, as indicated in FIG. 1, and overlying said wall portions is a cover plate 150.

Centrally transversely of said front wall **145** is a vertical slot **145***a*, and depending into said slot from said cap member **141** is a pin **152**. The lower end of said pin **152** is spaced somewhat above the adjacent end of a bar **153** here shown as being substantially parallelepiped in form and extending rearwardly having its rear end portion disposed between the rearward ends of said sides **147** and **148**. As indicated in FIG. 4, said bar **153** will be normally in a horizontal position. Disposed between the rear end portions of the walls **147** and **148** of somewhat greater width than said bar **153** is a bar **155** having the rear end portion of said bar **153** disposed within its upper portion to be integral therewith, and disposed transversely therethrough and secured in the adjacent portions of said sides **147** and **148** is a pin **157**.

Extending upwardly from said bar **153** somewhat rearwardly thereof is a pin **159** having secured to its upper end portion one end of a coiled spring **160**, with the other end of said spring being secured to a horizontal pin **162** extending across said slotted opening **145***a* at the upper portion thereof. Thus said spring **160** will normally urge said bar **153** into a horizontal position.

An operating handle **162** is provided comprising an elongated cylindrical rod **163** disposed through said bracket **127** and having one end **164** rotatably secured within the lower end portion of said bar **155**. Circumferentially about said rod **163** adjacent said bar **155** are longitudinally extending markings **167** here indicating intervals of .005 inch. In connection with said markings **167** is a reference line **168** appearing on the adjacent surface of said bar **155**.

At the other end of said rod **163** is a handle **170** freely rotatably mounted on said rod, and mounted on said rod forwardly of said handle **170** is a knurled hand gripping portion **171** adapted to rotate integrally with said rod. The major portion of said rod **163** is threaded for engagement with said half nut threaded portion **129**. Said handle **162** is secured to said bars **153** and **155** whereby a downward thrust of said handle will pivot said bar **153** on said pin **157** to have its free end engage the pin **152** to raise the cap member **141** and pins **140** to cause said clamping mechanism **130** to be in open position.

In operating this device, first a major adjustment is made to position the device to accommodate the brake shoe to be ground to the dimension of a certain size of brake drum. There are a number of standard sizes, some of which are indicated by the indicia **77**, and often the drum will be somewhat larger than a standard size where it has been turned or refaced. This major adjustment requires the use of only one hand of the operator with which hand the pin **85** is drawn outwardly against the pressure of the spring **86** and away from its engagement with the rod **79**. The carriage is then easily moved forwardly or rearwardly on the rods **62** and **63** to have the shank of the pin **85** come into alignment with the numeral indicating the standard size of the brake drum to be used. The pin **85** is released and said spring **86** will urge it into relation with a corresponding detent in the rod **79**. Said detents are machined to provide an accurate alignment with the indicia **77**. Said detents **83** will be accurately aligned with the indicia **77** when the dial **96***a* is at a zero position.

For a second and more accurate adjustment of the brake shoe as to the radius of its arcuate movement for its engagement with the grinding member **29**, a secondary adjustment is made by the same hand of the operator as above indicated by rotation of the handle **96** with each rotation thereof adapted to move the carriage **66** one-tenth of an inch, and the number of rotations made of said rod **79** will be indicated by the movement of the reference line **101** with respect to the line markings **102**. Said carriage **66** is then locked in position on rods **62** and **63** by means of the locking pin **70**.

During the above adjustments, the other hand of the operator will be positioned on the operating handle **162** and this hand remains so positioned throughout the operation of the device. When said adjustments have been completed, said operator will depress and handle **162** by pressure on the portion **170** thereof which will result in the raising of the pins **140** to place the clamping mechanism **130** in open position. A brake shoe A will then be grasped by the free hand of the operator and placed in grinding position, as indicated in FIG. 1, by having the flange portion B thereof disposed between the pins **140** and the pins **136**. Said operating handle **162** is permitted to be raised to its normal position by action of the spring **160** and by the action of the springs **143** which will cause the pins **140** to bear against the brake shoe flange B to hold the same in position.

When the above adjustments have been made, the handle portion **170** will be depressed slightly to lower the threaded portion **163** just out of engagement with the half nut **129** without raising the pins **140**, which is made possible by the spacing or gap between the lower end of pin **152** and the adjacent surface of the member **153**. Thus it is possible to slide the clamping head forwardly quickly to place the brake lining C into engagement with the grinding wheel **31**. Said handle is then raised into engagement with the half nut portion **129**.

The clamping head is then swung to one side. Said brake shoe lining C is then moved into a cutting engagement with the grinding wheel **31** by rotation of the knurled handle portion **171** which rotates the rod **163**. The amount of rotation will be guided by the markings **167** with regard to the reference mark **168**. This adjustment is made by the operating hand of the operator with this hand being in its normal operating position on the handle **162**.

With the above last mentioned adjustment having been made, the operator will move his hand rearwardly from the knurled portion **171** to the outer handle portion **170** which is rotatably carried on the rod **163** whereby any twisting motion of the hand of the operator will not cause any rotation of the rod **163**. The operator will then swing the clamping head **130** through an arc with the pin **118** forming the pivot member and into cutting engagement with the grinding wheel **31**. The above last mentioned adjustment will continue to be made after each complete swing of the clamping head until the outer surface of the brake shoe lining has been satisfactorily dressed or ground.

With the grinding wheel **31** in operation, the fan **44** will be in operation simultaneously and will cause a downward suction of the material cut away from the brake shoe lining C and will cause said material to be drawn downwardly through the slots **15***b* in said base plate portion **15***a* and downwardly into the housing **40** therebelow from which point said material will be exhausted outwardly through the outlet **41** and conduit **42** to the atmosphere, or if desired said conduit **42** may be formed as a receptacle.

Thus it is seen that I have provided a brake shoe grinding device which permits one hand or the operating hand of the operator to be in constant engagement with the operating handle **162** and which permits the major adjustment and also the adjustment with the handle **96** to be made with the other or free hand of the operator and permits the insertion and removal of brake shoes with said other or free hand of the operator, and which as a result provides for a very efficient and speedy operation and for a minimum of lost motion on the part of the operator.

It will of course be understood that various changes may be made in the form, details, arrangement and proportions of the parts, without departing from the scope of applicant's invention, which, generally stated, consists in a device capable of carrying out the objects above set forth, in the parts and combinations of parts disclosed and defined in the appended claims.

What is claimed is:

1. A brake shoe grinding device having in combination,
a base member, a grinding means on said base member,
a pair of transversely spaced bars mounted on said base member vertically spaced therefrom and extending in a direction toward and away from said grinding means,
a carriage member slidably mounted on said bars, spring pressed means for slidably positioning said carriage member at certain different points longitudinally of said bars, means extending longitudinally of said bars for engagement by said spring pressed means at said certain different points thereon,
a pivotal supporting member upstanding from said carriage member, a second pair of transversely spaced bars slidably mounted in said supporting member and extending in a direction parallel to said first bars, a spring pressed clamping mechanism carried on said second pair of bars movable to certain points toward and away from said grinding means,
a bracket upstanding from said supporting member,
a handle extending longitudinally of said pivotal supporting member and attached to said spring pressed clamping mechanism actuating the same by vertical swinging movement to engage and disengage a brake shoe and being rotatably connected thereto and in connection with said bracket for moving said clamping mechanism longitudinally of said supporting member toward and away from said grinding means relative to engagement therewith.

2. The structure set forth in claim 1,
said clamping mechanism comprising a pair of vertically spaced flanged portions,
a pair of transversely spaced pins upstanding from the lower of said flanged portions,
a second pair of pins vertically aligned with said first pair of pins,
means normally urging said respective pairs of pins into engagement with one another to grip said brake shoe therebetween,
means connecting said handle to said second pair of pins and said handle moving said second pair of pins out of engagement with said first pair of pins to disengage said brake shoe.

3. The structure set forth in claim 1,
said handle having at its free end portion a hand holding portion freely rotatable relative to said handle and adjacent to said freely rotatable portion a hand gripping portion rigid with said handle.

4. A brake shoe grinding device having in combination,
a base member, a grinding mechanism in connection with said base member, a carriage mounted for longitudinal movement on said base member,
means mounted on said carriage for longitudinal and pivotal movement thereof, a clamping mechanism carried by said last mentioned means,
said clamping mechanism comprising spring pressed pins for gripping a brake shoe, and a handle connected to said clamping mechanism and extending longitudinally of said means, said handle being movable vertically to actuate said pins to engage and disengage a brake shoe and being movable longitudinally and pivotally relative to said carriage to position said clamping mechanism relative to said grinding mechanism.

5. A brake shoe grinding device having in combination,
a base member, a grinding mechanism in operative relationship with said base member,
a carriage slidably and pivotally mounted on said base member, a clamping mechanism mounted on said carriage comprising brake shoe gripping means, and
a handle disposed longitudinally of said carriage connected to said clamping mechanism actuating said brake shoe gripping means to engage and disengage a brake shoe and moving said carriage and clamping mechanism into operative association with said grinding mechanism.

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