Feb. 22, 1938. H. B. BARRETT 2,109,327

BRAKE RELINING MACHINE

Filed Oct. 14, 1936

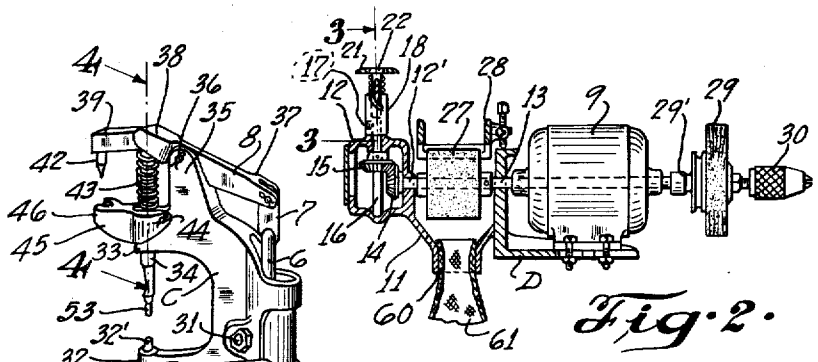

Fig. 2.

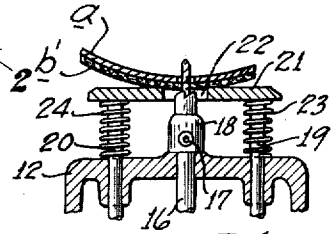

Fig. 3.

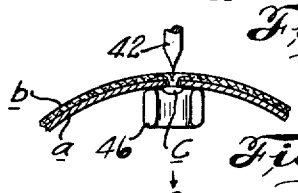

Fig. 5.

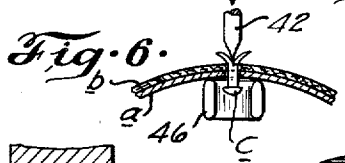

Fig. 6.

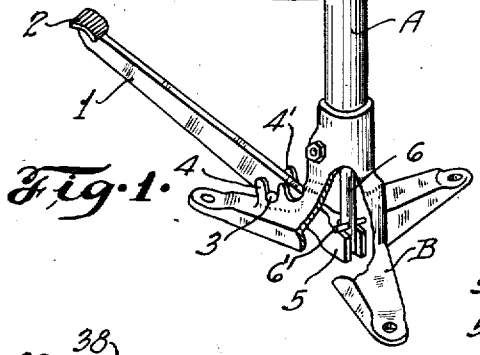

Fig. 1.

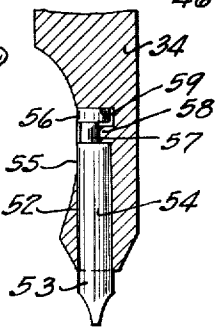

Fig. 7.

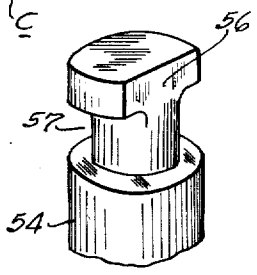

Fig. 8.

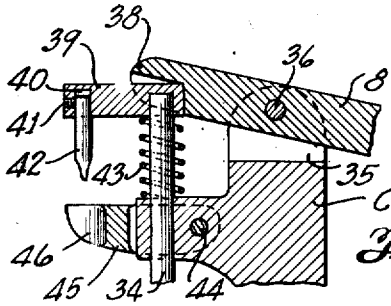

Fig. 4.

INVENTOR.

Harry B. Barrett.

BY

ATTORNEY.

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2,109,327

BRAKE-RELINING MACHINE

Harry B. Barrett, St. Louis, Mo., assignor to H. B. Barrett Company, Ltd., Los Angeles, Calif., a corporation of Nevada

Application October 14, 1936, Serial No. 105,474

10 Claims. (Cl. 29—26)

This invention relates to a certain new and useful improvement in brake-relining machines.

My invention has for its objects the provision of a brake-relining machine so constructed as to conveniently enable rapid, efficient relining operations, in which the lining surface grinder and drill are both aligned and directly coupled to the source of motive power without the intervention of belts or chain drives, and in which riveting and de-riveting members are actuable by the same mechanism, and to improve, unify, and simplify generally the brake-relining devices disclosed and fully described in United States Letters Patent No. 1,882,109, issued to me on October 11, 1932, and United States Letters Patent No. 1,949,070, issued to me on February 27, 1934.

And with the above and other objects in view, my invention resides in the novel features of form, construction, arrangement, and combination of parts presently described and pointed out in the claims.

In the accompanying drawing,—

Figure 1 is a perspective view of a brake-relining machine constructed in accordance with and embodying my present invention;

Figures 2, 3, and 4 are fragmentary sectional views of the machine, taken approximately along the line 2—2, Figure 1, line 3—3, Figure 2, and line 4—4, Figure 1, respectively;

Figure 5 is a diagrammatic view, showing the de-riveter of the machine in operative position relatively to a brake-lining at an initial stage in a de-riveting operation;

Figure 6 is a diagrammatic view, showing the de-riveter of the machine in operative position relatively to a brake-lining at an intermediate stage in the de-riveting operation;

Figure 7 is a fragmentary vertical sectional view of the machine, showing in detail the riveting tool and its socket; and

Figure 8 is an enlarged fragmentary perspective view of the head of the riveting tool of the machine.

Referring now in more detail and by reference characters to the drawing, which illustrates a preferred embodiment of my present invention, A designates a preferably hollow tubular post or standard, which at its lower end is rigidly mounted in a base B, and which at its upper end carries a head-bracket C, a motor-supporting plate or bracket D being adjustably mounted at an intermediate position on the standard A, as shown.

Fulcrumed on the base B, is a foot-lever 1 provided at its outer end with a preferably integral foot-pedal 2. Intermediate its ends, lever 1 has a pivot-pin 3 for rotatively engaging a pair of oppositely disposed upwardly presented bifurcated bosses or fulcrum-members 4, 4', formed preferably integrally on the base B, lever 1 at its inner extremity projecting inwardly beyond the pin 3 to the interior of base B and being provided with a bifurcation or yoke 5.

Disposed longitudinally for vertical movement within the standard A, is an actuating rod 6 having a cross-pin 6' in its lower end for engagement with the yoke 5 and having at its upper end a flattened or tongue portion 7 for engagement with a rocker arm 8 of a combined riveter and de-riveter, in a manner and for a purpose presently more fully described.

Preferably shiftably mounted on the bracket or plate D, is a suitable prime mover in the form preferably of an electric motor 9, which is connected in a conventional manner through a flexible conduit 10 with any suitable source of electric power.

Rigidly mounted on, and forming substantially a part of, the bracket or plate D, is a preferably cast metal lateral extension including an open-top so-called basin 11 and a shell-like end-portion or housing 12, and operably connected to the shaft of the motor 9, projecting over the basin 11 and journaled in a bearing 12' formed in a wall of the housing 12, as best seen in Figure 2, is a driven shaft 13.

Fixed on the outer end of shaft 13, is a vertically disposed bevel gear 14, which meshes with a horizontally disposed bevel gear 15 fixed on a drilling shaft 16 extending vertically and operatively journaled in the walls of the housing 12, as best seen in Figure 2.

Removably secured, as by a flat-point hollow set-screw 17, on the upper extended end of shaft 16, is a combined rivet-hole drilling and countersinking tool 18 of the type fully disclosed and described in my earlier United States Letters Patent No. 1,882,109, of October 11, 1932.

Slidably mounted for vertical movement in the housing 12 on relatively opposite sides of the tool 18, is a pair of parallel drill guide supports 19, 20, rigidly mounted across the upper extremities of which is a drill guide-plate 21 provided with a central aperture 22 of a size to permit the guide-plate 21 to freely move downwardly about the tool 18 for purposes presently appearing, each of the guide supporting members 19, 20, being encircled by a compression spring 23, 24, which are held between the under surface of the guide-plate 21 and the upper surface of the hous-

ing 12 for normally yieldingly urging the guide-plate 21 upwardly away from the housing 12, as best seen in Figure 3.

Mounted at an end for vertical adjustment in a wall of the bracket D, is an inverted substantially L-shaped indicator 25 provided at the outer end of its horizontally projecting leg 25' with a downwardly extending vertically disposed pointer-arm 26 co-axially aligned with the tool 18 for facilitating the accurate and precise centering or positioning of the work over the tool 18.

Rigidly mounted on the driven-shaft 13 over the basin 11, as also best seen in Figure 2, is an emery or other suitable type of grinding or abrading wheel 27, and swingably mounted in a wall of basin 11 for co-operation with the wheel 27 in relining operations, is a combined guard and gauge member 28, the wheel 27 and guard 28 being substantially of the type and kind disclosed and fully described in my earlier United States Letters Patent No. 1,949,070, issued February 27, 1934. It should be noted, however, that, in the present machine, the abrasive wheel assembly is compactly and conveniently arranged and aligned with the drilling assembly for conjoint and direct operation on the driven shaft 13.

At its other side, the shaft of motor 9 is preferably extended outwardly to receive and accommodate the hub 29' of a circular wire brush 29 and a chuck 30, which are thus conveniently presented for accessory purposes incident to brake-relining operations.

The head bracket C, which, through the engagement of a conventional form of wedge-bolt 31 with the standard A, may be adjustably positioned on the standard A at a selected location, is approximately of C-shape in side elevation, as best seen in Figure 1, and comprises a lower radially outwardly extending substantially horizontally disposed anvil supporting arm 32 and an upper radially outwardly extending bearing arm 33, in which latter a riveting-plunger 34 is suitably mounted for vertical reciprocation, an anvil member 32' being alignedly mounted on the lower arm 32.

Forming preferably an integral part of the bracket C and upstanding from the upper arm 33, is a bifurcated fulcrum-member 35 equipped with a bearing pin 36 for pivotally supporting the rocker arm 8, which, at one extremity, has a yoke 37 for pivotal engagement with the reduced tongue 7 of the rod 5 and at its other extremity has a downwardly and outwardly opening U-shaped recess 38.

At an end removably mounted on the upper extremity of the riveter-plunger 34 and disposed within the recess 38 of arm 8, is an outwardly projecting de-riveter arm 39, best seen in Figure 4, provided with a downwardly opening recess 40, in which is removably fitted and secured, as by a socket-type set-screw 41, a de-riveter bit 42. And co-axially mounted around the riveter-plunger 34 and impingingly held between the under surface of the de-riveter arm 39 and the upper surface of the bearing arm 33, is a relatively strong or stiff compression spring 43 for normally yieldingly retaining the arm 39 and the plunger 34 operatively in upward position within the recess 38 of the rocker arm 8, also as best seen in Figure 4.

Detachably secured, as by a conventional cotter-keyed pin 44, upon the outer end of the upper bracket arm 33, is a de-riveter jaw member 45 provided at its operative end with a horizontally outwardly extending U-shaped portion 46, between the extended arms of which the de-riveter bit 42 may freely pass while the work is supportingly held thereupon.

The plunger 34 is provided at its lower end with an aperture or socket 52 for receiving and retaining a suitable bit or tool 53, illustrated in detail in Figures 7 and 8, which comprises a cylindrical shank portion 54 having a size to fit snugly within the tool-receiving aperture or socket 52 and also having a flat-faced butt or end portion 56, as best seen in Figure 8. Also formed in the plunger 34 and extending through a side thereof, is a drift opening 55, through which a suitable tool may be inserted for drifting the bit or tool 53 out of the socket 52 as occasion may require. Formed in the tool 53 adjacent its butt end 56, is an annular groove or channel 57 for embracing a shoulder 58 formed in the socket 52, as best seen in Figure 8, for retaining the tool 53 in the plunger 34.

In placing the tool 53 in the plunger 34, its flat faced portion 56 is brought opposite the retaining shoulder 58, so that the tool 53 will clear the shoulder 58, whereupon the tool 53 is inserted fully into the socket 52 and rotated about its vertical axis, thereby bringing the end-portion 56 around so that the retaining shoulder 58 is engaged in the channel 57, which should preferably be somewhat wider than the shoulder 58 to allow some vertical play to permit the tool 18, upon entering the work, to move relatively upwardly in the plunger 34 against the abutment surface 59 in the socket 52. Thus, it will be apparent that a plurality of variously shaped tools may be interchangeably fitted in the plunger 34 for different types of brakes.

In use and operation, a worn lining is removed from the brake-shoe or band being repaired by placing the shoe *a* and lining *b*, as shown in Figures 5 and 6, over the yoke portion 46 of the arm 45 for disposing a fastening rivet in position between the arms of the yoke 46. The pedal 2 is then suitably depressed, as by foot-action, pivoting the lever arm 1 about the pin 3 and thereby moving the rod 6 vertically upwardly and actuating the rocker arm 8 to depress the arm 39, bringing the tool 42 into dislodging engagement with the upset end of the rivet *c*, as shown in Figure 5. As the foot-action continues, the tool 42 is driven downwardly against the rivet, thereby causing the upset ends of the rivet to bend back to original approximately parallel relation and consequently forcing the rivet out of the shoe *a*, as shown in Figure 6, thus partially releasing the lining. As each successive rivet is displaced in the same manner, the particular lining is ultimately entirely released, when it may be discarded.

A new lining segment *b'* is then placed in the shoe *a* and prepared to receive new attaching rivets by placing the shoe *a* and lining *b'* on the drill guide plate 21, with the lining surface down, one of the apertures in the shoe *a* being positioned over the opening 22 in the guide-plate 21 and axially aligned with the drilling tool 18 by setting the center thereof directly beneath the pointer arm 26. The motor 9 is then energized, whereupon the rotatory motion of the driven shaft 13 is transmitted to the drilling tool 18 through the intermeshing bevel gears 14, 15, and the shaft 16, and the lining *b'* and shoe *a* pressed then downwardly into drilling engagement with the rotating tool 18, it being obvious that, as the lining *b'* and shoe *a* are pressed downwardly, the guide-plate 21 and the guide

rods 19, 20, will move downwardly against the pressure of the spring 23, 24, permitting the tool 18 to penetrate the lining.

As described in my Letters Patent No. 1,882,109, the tool 18 will drill one hole of selected diameter entirely through the lining and will simultaneously countersink the hole to a predetermined depth, thereby in one operation preparing the brake-shoe and lining to receive an attaching rivet, it being apparent, of course, that the drilling operation may be successively repeated according to the number of attaching rivets for which the particular brake-shoe is designed.

After the rivet receiving holes have been drilled and countersunk, a rivet *c'* is placed in each hole successively and secured in position by inserting the riveting tool 53 in the plunger 34, as above described, and placing the brake-shoe *a* and lining *b'* with the rivet *c'* in place over the anvil-portion 32 of the bracket C, so that the head of the rivet *c'* is in contact with the anvil proper 32', the pedal 2 being then depressed by foot-action for bringing the tool 53 forcibly down upon and upsetting the rivet end, thus tightly clamping the lining *b'* to the brake-shoe.

When the lining *b'* has been securely attached to the brake-shoe, as above described, the lining surface is ground to true concentricity and smoothness by setting the grinder gauge 28 to a desired position, as more fully described in my Letters Patent No. 1,949,070, placing the shoe *a* and the attached lining *b'* against the now rotating grinder wheel 27, and passing the lining surface to and fro across the surface of the grinder wheel 27 until the grinding operation is finished, whereupon the relined brake-shoe is ready for installation in an automotive or other brake assembly.

In the event that some remote grinding, drilling, or turning operation becomes necessary, a flexible shaft may be coupled in the chuck 30 and attached to a suitable tool for performing the additional operation desired. Similarly, the conveniently presented brush 29 may be brought into use as may be required.

Preferably, the basin 11 has a throat 60, to which a catch-bag 61 may be suitably secured for hygienically receiving the dust and grit resulting from the grinding operation of the wheel 27.

It will be seen, therefore, that, by my present invention, I provide a unitary, compact, and highly efficient machine for performing a brake-relining operation in a rapid, accurate manner, with remarkable economy in labor, time, and materials, and it should be understood that changes and modifications in the form, construction, arrangement, and combination of the several parts of the machine may be made and substituted for those herein shown and described without departing from the nature and principle of my invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:—

1. In a brake-relining machine, combined grinding and drilling means comprising a motor, a shaft rotatable with the motor, an abrading wheel mounted for rotation on the shaft, gear means operatively mounted on the shaft forwardly of the abrading wheel, and a drilling tool operably connected for rotation to the gear means, said abrading wheel and said drilling tool all being disposed substantially within a unitary housing, having a catch-bag communicatingly mounted thereon for receiving the combined waste products, dust, and chips resulting from grinding and drilling operations.

2. In a brake-relining machine, combined grinding and drilling means including power driving means, a shaft operatively connected to the driving means, an abrading wheel mounted on the shaft for rotation therewith, gear means operatively on the shaft forwardly of the abrading wheel, a drilling tool operatively associated for rotation with the gear means, and a yielding depressible guide-plate positioned for movement about the drilling tool.

3. In a brake-relining machine, in combination, a standard, a bracket on the standard, a de-riveting-jaw mounted on the bracket, a rod yieldingly mounted slidably on said jaw, an arm mounted on said rod, a de-riveting tool carried by the arm for co-operation with said jaw, and means including an arm mounted for rocking movement on the bracket for depressing said rod and its carried tool.

4. In a brake-relining machine, in combination, a standard, a bracket on the standard, a de-riveting-jaw mounted on the bracket, a rod yieldingly mounted slidably on said jaw, an arm mounted on said rod, a de-riveting tool carried by the arm for co-operation with said jaw, and means including an arm mounted for rocking movement on the bracket for depressing said rod and its carried tool, said arm being recessed for enclosingly embracing the inner end of the first arm.

5. In a brake-relining machine, in combination, a standard, a bracket on the standard, a de-riveting-jaw detachably mounted on the bracket, a yielding riveting-plunger mounted slidably on said jaw, an arm mounted detachably on the plunger, a de-riveting tool carried by the arm for co-operation with the jaw, and means including a rocker-arm mounted on the bracket for depressing the plunger and its carried tool.

6. In a brake-relining machine, in combination, a standard, a bracket mounted on the standard and having a pair of outwardly presented superposed jaws, a rod mounted for vertical slidable movement in, and extending upwardly beyond, the upper jaw, an arm mounted on the upwardly extended end of said rod in alignment with the upper jaw, a de-riveting tool carried by the arm for co-operation with said upper jaw, and means including an arm mounted for rocking movement on the bracket for depressing said rod and its carried tool.

7. In a brake-relining machine, in combination, a standard, a bracket mounted on the standard and having a pair of outwardly presented superposed jaws, a rod mounted for vertical slidable movement in, and extending upwardly beyond, the upper jaw, spring means operatively associated with the rod for normally urging said rod upwardly, an arm mounted on the upwardly extended end of said rod, a de-riveting tool carried by the arm for co-operation with said upper jaw, and means including an arm mounted for rocking movement on the bracket for depressing said rod and its carried tool.

8. In a brake-relining machine, in combination, a standard, a bracket mounted on the standard and having a pair of outwardly presented superposed jaws, and a rod mounted for vertical slidable movement in the upper jaw, being provided at its lower extremity with riveting tool means co-operable with the lower jaw and being provided at its upper extremity with a radially outwardly disposed arm, said arm being pro-

vided with de-riveting tool means co-operable with the upper jaw.

9. In a brake-relining machine, in combination, a standard, a bracket mounted on the standard and having a pair of outwardly presented superposed jaws, a rod mounted for vertical slidable movement in the upper jaw, being provided at its lower extremity with riveting tool means co-operable with the lower jaw and being provided at its upper extremity with a radially outwardly disposed arm, said arm being provided with de-riveting tool means co-operable with the upper jaw, and compression spring means disposed loosely around the rod and at its respective ends mounted abuttingly between the under face of the arm and the upper face of the upper jaw for normally urging the rod upwardly.

10. In a brake-relining machine, in combination, a standard, a bracket mounted on the standard and having a pair of outwardly presented superposed jaws, a rod mounted for vertical slidable movement in the upper jaw, being provided at its lower extremity with riveting tool means co-operable with the lower jaw and being provided at its upper extremity with a radially outwardly disposed arm, said arm being provided with de-riveting tool means co-operable with the upper jaw, compression spring means disposed loosely around the rod and at its respective ends mounted abuttingly between the under face of the arm and the upper face of the upper jaw for normally urging the rod upwardly, and rocker-arm means mounted on the bracket and loosely embracingly engaged at its one end with the upper extremity of the rod for depressing said rod.

HARRY B. BARRETT.