Sept. 4, 1928. 1,683,048

E. J. PAQUE

DOUBLE WHEEL GRINDER

Filed July 29, 1925

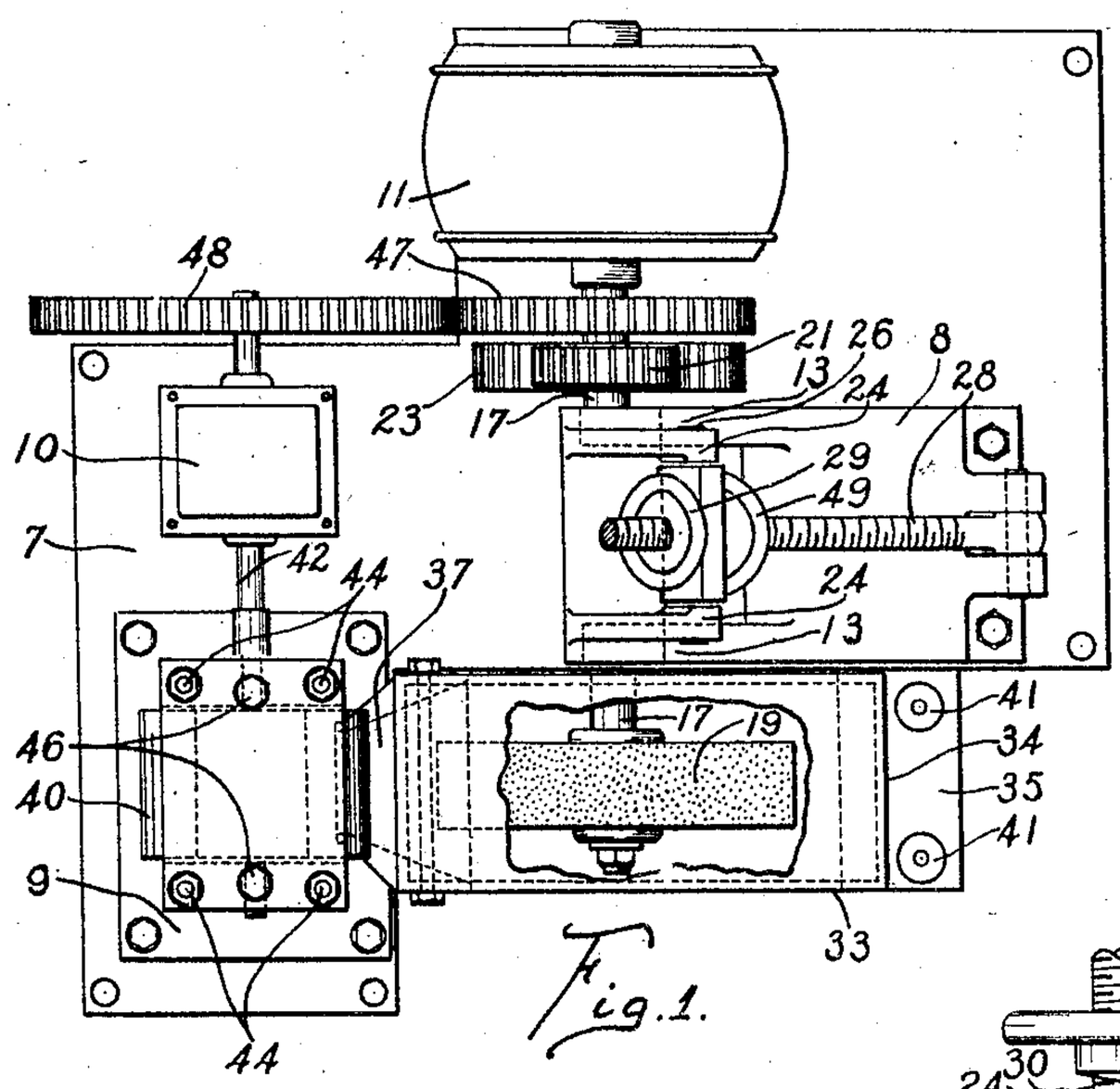

Fig. 1.

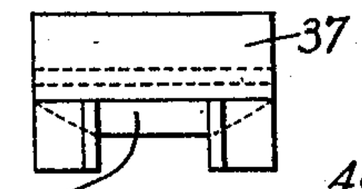

Fig. 4.

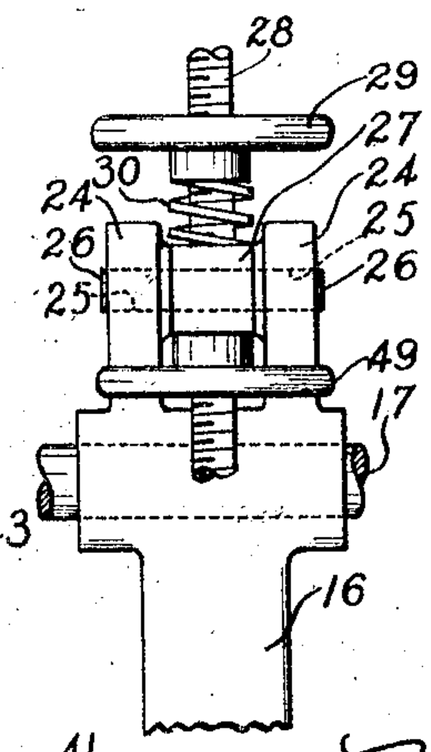

Fig. 3.

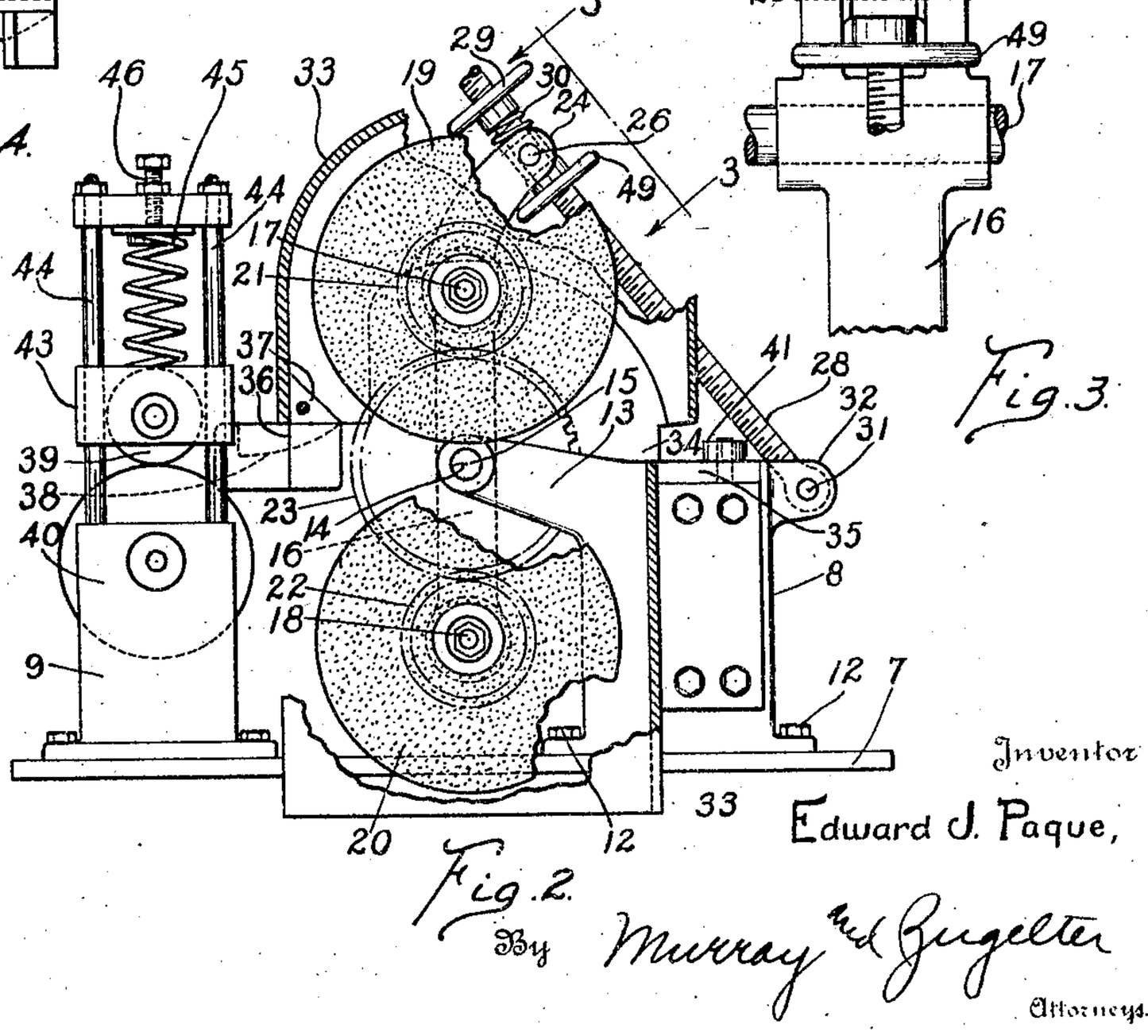

Fig. 2.

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UNITED STATES PATENT OFFICE.

EDWARD J. PAQUE, OF CINCINNATI, OHIO, ASSIGNOR TO THE POLLAK STEEL COMPANY, OF CARTHAGE, OHIO, A CORPORATION OF OHIO.

DOUBLE-WHEEL GRINDER.

Application filed July 29, 1925. Serial No. 46,909.

This invention relates to grinding and polishing apparatus and has for an object the provision of a simple and efficient means of grinding and polishing metal bars and the like.

Another object is to provide a device of this kind by means of which two opposed sides of a bar may be ground or polished simultaneously.

Another object is to provide a device of this kind which will automatically feed bars of stock to be polished between the grinding or polishing wheels.

Another object is to provide a device of this kind in which the feed is driven through the same power means as the grinder means so that there is attained the correct lineal travel of the stock.

These and other objects are attained by the means described herein and disclosed in the accompanying drawings, in which:

Fig. 1 is a top plan view of the device of my invention, parts being broken away.

Fig. 2 is a side elevation of the device shown in Fig. 1, parts being broken away.

Fig. 3 is a fragmental view taken on line 3—3 of Fig. 2.

Fig. 4 is a plan view of a guide means forming a detail of my invention.

The device of my invention comprises a pair of grinding or polishing wheels rotatably mounted upon a housing member and adapted to receive between them a bar of stock to be ground or polished. Fixed guides serve to retain the stock in a given line and a feed mechanism serves to feed the stock between the grinding wheels. The center location of the grinding wheels on the housing is fixed but the housing is pivotally mounted in a plane through which the stock travels so that by adjusting the housing about its pivotal mounting, the peripheries of the grinding wheels may be moved toward and away from the stock. The device is driven through a single motor or other power means and by using suitable reduction gearing, the feed of the stock can be given the proper lineal travel with relation to the grinding wheels.

Referring to the drawings, the device comprises a base structure composed of a base or floor plate 7 carrying a housing base 8, feed or pinch roll support 9, speed transformer or reduction gear mechanism 10 and a power means such as a motor 11. The housing base 8 is secured to the floor plate 7 by any suitable means such as cap screws 12 and is provided at its top with a pair of spaced brackets 13 having aligned bores 14 therein for receiving a swivel shaft 15. The housing 16 is pivotally mounted intermediate its ends, upon the swivel shaft 15 and carries spindles 17 and 18 upon the outer ends of which grinding or polishing wheels 19 and 20 respectively may be fixedly mounted. The opposite ends of the spindles 17 and 18 are provided with pinions 21 and 22 respectively, these pinions being driven through gear 23 carried by the shaft of the motor 11. From Fig. 2 it will be apparent that when the gear 23 is driven in a given direction, the pinions 21 and 22 will both be driven in the direction opposite thereto and the grinding or polishing wheels 19 and 20 will be rotated therewith. It will also be noted that the peripheries of the grinding wheels 19 and 20 will be moving in opposite directions at their closest points adjacent the center of the swivel shaft 15. Therefore, when a bar of stock is passed between the peripheries of the wheels 19 and 20, the wheels will operate on opposite sides of the stock and in opposite directions so that there is no tendency of the grinding wheels themselves to determine the rate of travel of the stock between them. The upper end of the housing 16 is provided with a pair of spaced arms 24 having aligned perforations 25 therein for receiving studs 26. The studs 26 enter suitable sockets in a swivel block 27 and serve to pivotally mount said swivel block between the arms 24. The block 27 is provided with a transverse bore through which a tilting screw 28 may pass. The tilting screw carries hand wheels 29 and 49, each of which has a threaded bore for engaging the threads on the screw 28. One of these hand wheels is disposed on each side of the swivel block 27 and a spring 30 may be provided between said block and the upper hand wheel if desired. The tilting screw 28 is pivotally mounted upon the housing base 8 in any suitable manner such as on a pivot 31 extending through brackets 32 on the housing base 8. From the foregoing it will be apparent that when the hand wheels 29 and 49 are moved longitudinally along the tilting screw 28, the housing 16 will be moved about its pivotal mounting whereby the perpendicular dis-

tance between the center of swivel shaft 15 and the spindles 17 and 18 will be decreased as the housing 16 is moved away from a perpendicular position. A wheel guard 33 takes the form of a hollow casting and substantially encloses the upper wheel 19 and lower wheel 20. The guard 33 however, is provided with an opening 34 disposed above a table like flange 35, the top of which is disposed in horizontal alignment with the center of swivel shaft 15. Directly opposite the opening 34, a second opening 36 is provided in the guard, said opening extending from a point slightly above the level of swivel shaft 15 to the bottom of the guard. At the top portion of this opening a rear stock guide member 37 is secured to the guard and is provided with a curved guiding face 38 which serves to direct a bar of stock between the pinch rolls or feed rolls 39 and 40. Guide rolls 41 are freely revoluble on the upper face of the table 35 and serve to direct a bar of stock between the grinder wheels 19 and 20. The pinch roll 40 is journaled in the support 9 and is connected to the speed transformer 10 through shaft 42. The movable pinch roll 39 is revolubly mounted in blocks 43 slidably mounted upon rods 44 and is kept in engagement with the roll 40 by means of a powerful compression spring 45, the pressure of which may be varied by any suitable means such as adjustment screws 46. Gear 47 on the motor 11 meshes with gear 48 which in turn actuates the speed transformer 10 so that the pinch roll 40 may be arranged to travel at a predetermined rate of speed with relation to the grinder wheels 19 and 20.

In operation, when it is desired to grind or polish flat bar stock or shapes, the motor 11 is put into operation whereupon the gear 23, through pinions 21 and 22, drives the spindles 17 and 18 to actuate wheels 19 and 20. A bar of stock is then passed between the guide rolls 41 through opening 34 in the guard 33 until it is engaged by the peripheries of wheels 19 and 20. If the housing 16 be in a vertical position, as shown in Fig. 2, and the wheels do not touch the bar stock, the lower hand wheel 49 would be screwed down for a distance on the screw 28 and upper hand wheel 29 would also be screwed downwardly, pushing the swivel block 27 before it and thus moving the housing 16 until the peripheries of both grinding wheels would engage the stock. The lower hand wheel 49 would then be tightened so that the housing 16 would remain in its adjusted position. The spring 30 serves to allow slight yielding of the housing 16 when appreciable irregularities occur on the stock to be ground. The stock is then pushed forward and fed between the grinding wheels 19 and 20 until it engages the face 38 of the guide 37 which serves to guide the stock between pinch rolls 39 and 40. The pinch roll 39 being spring urged toward the roll 40 will automatically accommodate various thicknesses of stock without requiring any manual adjustment. The pinch roll 40 being power driven at a predetermined rate of speed, will then draw the bar of stock through the grinder without further attention of the operator. In the polishing operation, the grinding wheels 19 and 20 are replaced with buffing or polishing wheels of any desired type and further operation of the machine is as heretofore described. The guard 33 being open on the side toward the pinch rolls, permits the housing 16 to be tilted until the peripheries of the grinding wheels may assume a position substantially on a line with the top of table 35 and the top of pinch roll 40. In this way very thin stock may be ground or polished as easily as thick stock. The guard 33 forms a substantial closure about the wheels so that little or no dust and grit from the wheels and stock may find its way to the spindle bearings, motor or speed transformer, and those operating the devices are also protected against any possible injury to health or person from dust or breakage of the grinding wheels.

What I claim is:

1. In a grinding and polishing device the combination with a pivotally mounted housing member, of spindles rotatably mounted adjacent the opposite ends of the housing, abrasive wheels fixedly mounted on the spindles, guide means disposed in horizontal alignment with the pivotal mounting of the housing and on opposite sides thereof, and means for positioning the housing about its pivotal mounting whereby the peripheries of the abrasive wheels may be moved toward and away from the plane in which the guide means and housing mounting are disposed.

2. In a grinder the combination with a base, of a housing pivotally mounted intermediate its ends upon the base, spindles rotatably mounted adjacent opposite ends of the housing, grinding wheels on the spindles, guide means disposed in a horizontal plane with the pivotal center of the housing, means for adjustably fixing the housing about its pivotal mounting, and unitary means for rotating the spindles.

3. In a grinding and polishing device the combination with a housing member pivotally mounted intermediate its ends, of a pair of abrasive wheels rotatably mounted on the housing on opposite sides of the pivotal mounting thereof, means for rotating the wheels in a common direction, means for definitely adjusting the housing about its pivotal mounting whereby the peripheries of the wheels adjacent the pivotal mounting on the housing may be moved toward and away from the horizontal plane passing through

the pivotal mounting of the housing, and actuated pinch rolls adapted to operate upon a bar of stock passed between the abrasive wheels in said horizontal plane.

4. In a device for simultaneously abrading two opposed sides of a bar of material the combination with a housing pivotally mounted intermediate its ends, a pair of abrasive wheels revolubly mounted on the housing on opposite sides of the pivotal mounting of said housing, a guard surrounding the wheels and having aligned openings therein disposed in a plane with the pivotal mounting of the housing, a pair of co-operating pinch rolls disposed without the guard and operating in alignment with the openings therein, guide means disposed above the opening adjacent the pinch rolls, guide means disposed below the other opening in the guard, means comprising a power unit, and gearing for simultaneously actuating the abrasive wheels at a given speed in a common direction and for operating the pinch rolls at a different speed, and means for adjusting the housing about its pivotal mounting whereby the peripheries of the abrasive wheels may be moved toward and away from the plane of the pivotal mounting of the housing.

5. In a grinding and polishing machine the combination of a pivotally mounted housing, spindles journaled adjacent opposite ends of the housing, abrasive wheels fixed to one end of each spindle, pinions carried by the opposite ends of said spindles, a power driven gear disposed between and meshing with the pinions for rotating the abrasive wheels whereby adjacent peripheral portions of said wheels are moved in opposite directions, power actuated feed rolls disposed in a given plane on one side of the pivotal mounting of the housing, a guide means disposed in said plane and on the opposite side of the pivotal mounting of the housing and means comprising a threaded shaft and a pair of threaded stops for clamping the housing in adjusted positions about its pivotal mounting whereby the adjacent peripheries of the abrasive wheels may simultaneously operate upon opposite sides of a bar of material retained between the guide means and feed rolls, said feed rolls being adapted to move a bar of stock to be operated on at a predetermined rate of travel between the abrasive wheels.

6. In a grinding and polishing machine the combination of a pivotally mounted housing, abrasive wheels journaled one adjacent each end of the housing, means for driving the abrasive wheels in a common direction whereby adjacent peripheral portions of said abrasive wheels are moved in opposite directions, power actuated feed rolls disposed in a given plane on one side of the pivotal mounting of the housing, a guide means disposed in said plane on the opposite side of the pivtotal mounting of the housing and means for clamping the housing in adjusted positions about its pivotal mounting whereby the adjacent peripheries of the abrasive wheels are simultaneously moved to and from said plane for simultaneous operation on opposed sides of a bar of material retained between the guide and feed rolls, said rolls serving to move the bar of material at a predetermined rate of travel between the abrasive wheels.

In testimony whereof, I have hereunto subscribed my name this 25th day of July, 1925.

EDWARD J. PAQUE.