Oct. 28, 1924. 1,513,604

H. KOSMOS

CYLINDER GRINDER

Filed Jan. 28, 1921 2 Sheets-Sheet 1

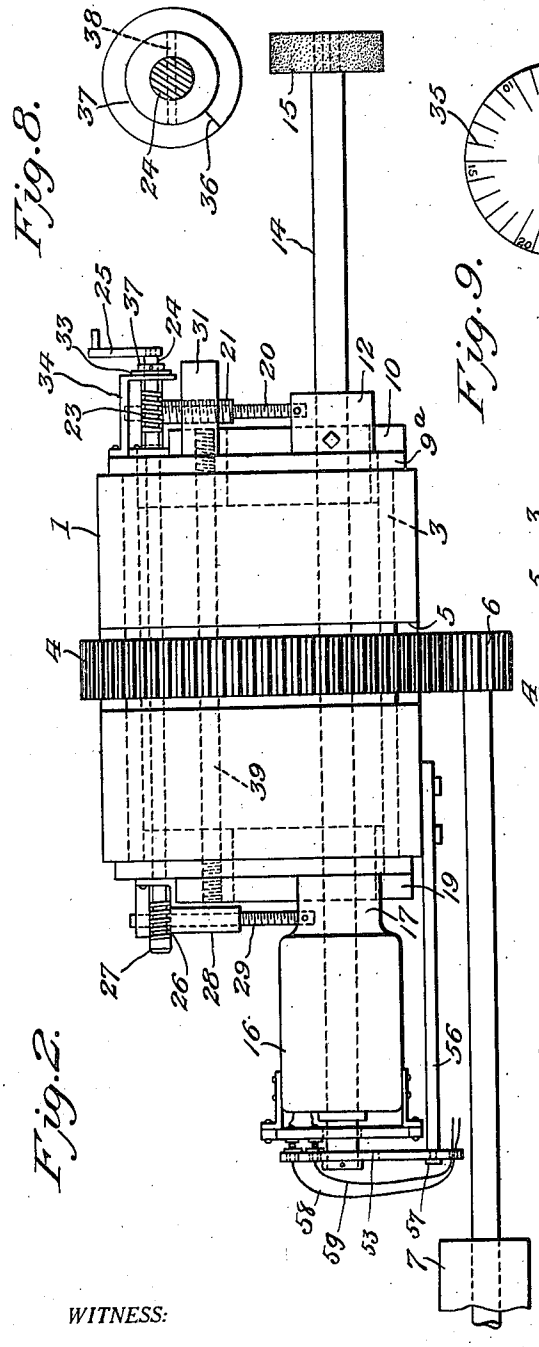


Fig. 2.

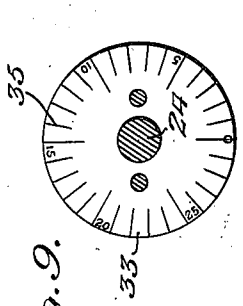


Fig. 3.

Fig. 1.

WITNESS:

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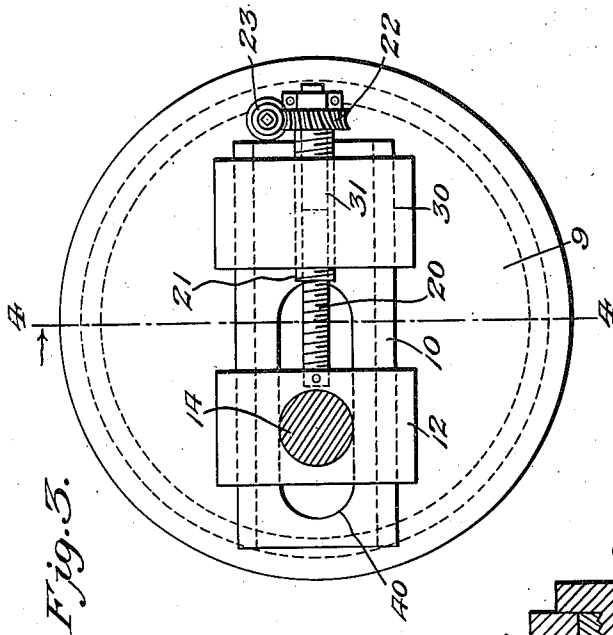


Fig. 5.

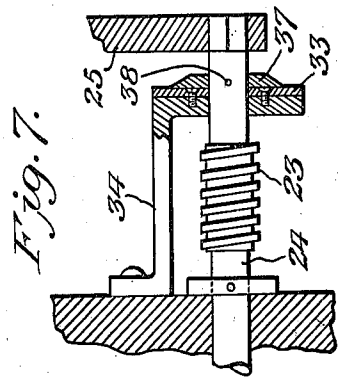


Fig. 7.

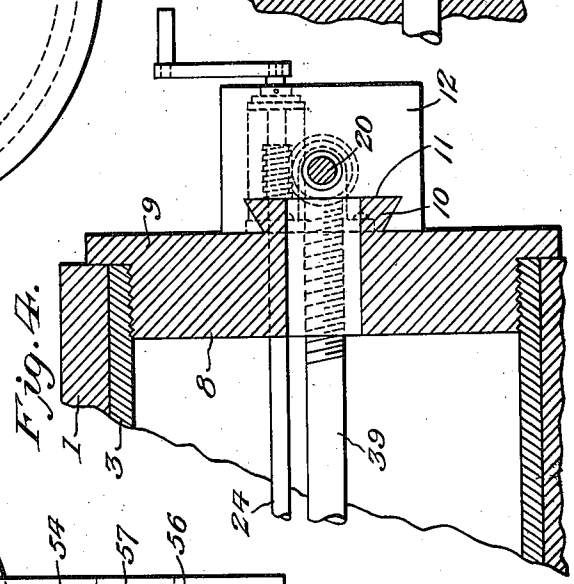


Fig. 4.

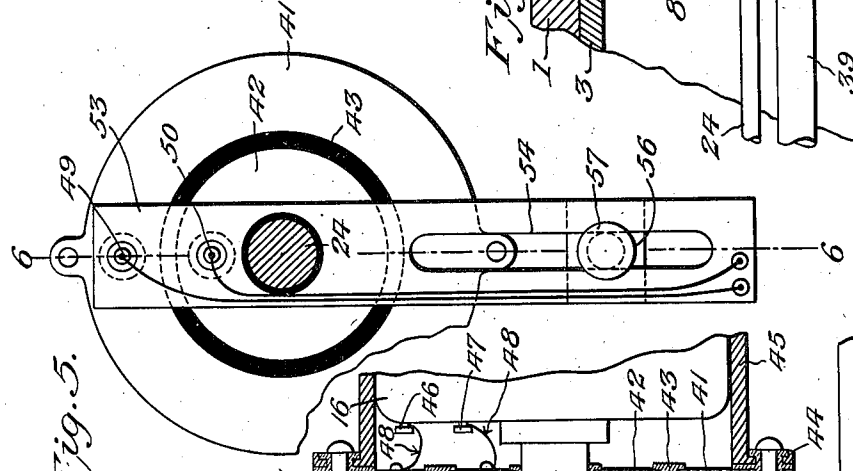


Fig. 5.

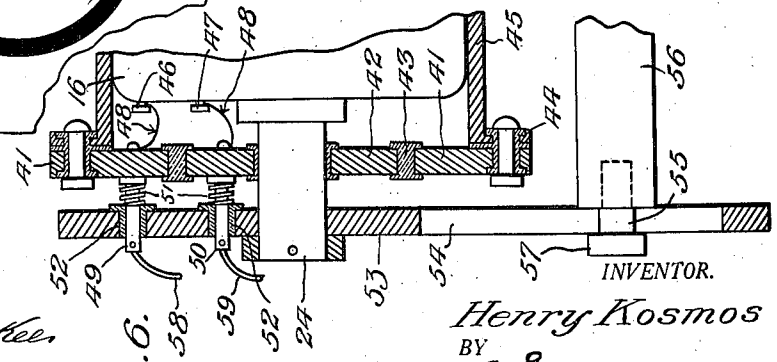


Fig. 6.

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Patented Oct. 28, 1924. 1,513,604

UNITED STATES PATENT OFFICE.

HENRY KOSMOS, OF CHICAGO, ILLINOIS.

CYLINDER GRINDER.

Application filed January 28, 1921. Serial No. 440,697.

To all whom it may concern:

Be it known that I, HENRY KOSMOS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Cylinder Grinders, of which the following is a specification.

This invention relates to grinding machines and an object of the invention is to provide a device particularly designed for grinding cylindrical or circular surfaces, such as the cylinders of an internal combustion engine.

Another object of this invention is to provide a grinder which includes a carrier structure rotatable for revolving a grinding wheel about a circular surface to be ground and also carries means for rotating the grinding wheel during its movement over the surface to be ground.

A further object of this invention is to provide means for adjusting the radial position of the axis of the grinding wheel relative to the axis of the carrier for regulating the circumference of the circular path in which the grinding wheel travels and also to provide a gauge structure by means of which very accurate adjustment of the grinding wheel may be had.

A still further object of this invention is to provide a grinding machine as specified which embodies, preferably, an electric motor for rotating the grinding wheel, preferably at an increased speed relative to the rotation of the carrier and also to provide a novel construction for permitting the transmitting of electric energizing current to the motor, the said structure designed to maintain operative energizing connection to the motor at all adjustments of the grinding wheel and during all movements of the grinding wheel and carrier.

Other objects of the invention will appear in the following detailed description and in the accompanying drawings wherein:

Fig. 1 is a side elevation of the improved grinding machine.

Fig. 2 is a plan of the improved grinding machine,

Fig. 3 is an end elevation of the grinding machine showing the grinding wheel carrying spindle in section.

Fig. 4 is a detail section through a part of the grinding machine illustrating the manner of mounting and adjusting the grinding wheel and is taken on line 4—4 of Fig. 2.

Fig. 5 is a fragmentary end view of the improved contact mechanism.

Fig. 6 is a section through the contact mechanism taken on the line 6—6 of Fig. 1.

Fig. 7 is a detail view, partly in section, of the mechanism for adjusting the position of the grinding wheel.

Fig. 8 is a detail section illustrating a part of the gauge for accurately regulating the adjustment of the grinder.

Fig. 9 is a detail view of a part of the gauge which co-acts with that part illustrated in Fig. 8 of the drawing, showing it slightly enlarged for the purpose of illustration.

Referring more particularly to the drawing, the improved grinding machine comprises a supporting structure 1 provided with a dovetail recess 2 to facilitate its mounting upon the table of any desired type of machine employed in grinding. The support 1 forms a housing for a carrier sleeve 3 upon which sleeve is mounted a worm gear 4, preferably intermediate the ends of the sleeve 3 and the housing portion of the support 1 is cut away as shown at 5 to permit free and unimpeded rotation of the sleeve. A worm 6 meshes with the worm gear 4 for rotating the sleeve 3 and is driven from any suitable outside power source as indicated at 7 in Fig. 1 of the drawings.

The sleeve 3 is internally threaded at its ends and receives therein the threaded plugs or portions 8 of the end blocks 9. The portions of the end blocks 9 which overhang the perimeters of the plugs 8 engage against the ends of the sleeve 3 and housing 1 as clearly shown in Figures 1, 2 and 4 of the drawings.

The block 9^a at one end of the carrier sleeve 3 is provided with a dovetail 10 extending diametrically thereacross and this dovetail seats in the dovetail slot 11 in a movable block 12. The movable block 12 rotatably supports the spindle 14 upon which a grinding wheel 15 of any approved construction is mounted. The shaft 14 extends longitudinally through the carrying sleeve 3 and forms the central or power shaft of an electric motor 16 which is supported by the block 9^b located at the end

of the sleeve 3 opposite the block 9^a. The motor 16 has a block 17 formed upon the casing thereof which is provided with a dovetail recess 18 in which the dovetail 19 engages. The dovetail 19 extends diametrically across the block 9^b and parallel with the dovetail 10 so as to permit aligning movement of the blocks 12 and 17.

The block 12 has an adjusting screw 20 connected thereto which seats in the internally threaded sleeve 21. The sleeve 21 has a worm gear 22 mounted thereon with which a worm 23 meshes. The worm 23 is carried by a shaft 24 upon which an operating crank handle 25 is mounted so that by manual rotation of the shaft 24 the sleeve 21 may be rotated, and since this sleeve is held against longitudinal movement, its rotation will feed the adjusting screw 20 either into or out of the sleeve 21, depending upon the direction of rotation of the latter, which will move the block 12 towards or away from the axis of the carrier sleeve 3. The shaft 24 extends longitudinally through the sleeve 3 and has a second worm 26 mounted thereon which meshes with a worm gear 27 carried by a sleeve 28. The sleeve 28 is internally threaded and receives therein adjusting screw 29 which is connected to the block 17 to permit synchronous adjusting movement of the blocks 12 and 17 and consequently maintaining proper alignment of the bearing surfaces in these blocks for the shaft 14.

A balancing weight or block 30 is mounted on the dovetail 10 and is adjusted synchronously with the block 12, it being provided with an internally threaded bore 31 which engages the external threads on the sleeve 21. Accurate adjustment of the shaft 14 and consequently of the grinding wheel 15 is permitted by means of the gauge structure illustrated in Figures 7, 8 and 9 of the drawing, which comprises a disc 33 mounted upon a bracket 34, which bracket is attached to the block 9^a and supports the shaft 24 as well as the disc 33. The disc 33 is provided with micrometer graduations 35 which are adapted to co-act with the graduations 36 on the disc 37. The disc 37 is pinned to the shaft 24 by an ordinary pin 38 and it has its perimeter beveled as clearly shown in Fig. 7 of the drawings, to permit accurate aligning of the graduations 36 with any one of the graduations 35 on the disc 33.

A suitable stay bolt 39 extends through the carrier sleeve 3 and is connected to the bolts 9^a and 9^b for increasing the rigidity of the structure and the blocks 9^a and 9^b are provided with substantially oval shaped cutout portions 40 through which the shaft 14 extends, the said cutout portions permitting adjustment of the shaft towards or from the axis of the carrier sleeve by the mechanism previously described.

Owing to the fact that the motor 16 rotates or revolves during the rotation of the carrier sleeve 3 a novel form of contact structure, to permit energizing of the motor, is provided, this contact structure which is specifically illustrated in Figures 5 and 6 of the drawing comprises rings 41 and 42 which are constructed of suitable electric conducting material and which are connected by a ring 43 of insulating material. The ring 41 is attached to an annular flange 44 formed on the housing 45 of the motor 16 and is suitably insulated therefrom while the ring 42 is mounted upon the shaft 24 being suitably insulated therefrom. The rings 41 and 42 are connected to the binding posts 46 and 47 of the motor 16 as shown at 48.

Brushes 49 and 50 engage the rings 41 and 42 respectively and are yieldably maintained in engagement with the outer sides of these rings by springs 51. The brushes 49 and 50 are mounted in sleeves 52 of insulation which are carried by an arm 53. The arm 53 is provided with a longitudinal slot 54 which receives therethrough the reduced portion 55 of the connecting arm 56. A head 57 is mounted on the arm 56 outwardly of the reduced portion 55 and engages against the outer surface of the arm 53 as clearly shown in Fig. 6 of the drawing for preventing lateral movement of the arm 53 off the arm 56. The bracing arm 56 is attached in any suitable manner to the support 1 and the provision of the slot 54 permits movement of the arm 53 relative to the arm 56 and the support 1 during movement of the motor 16 towards or from the axis of the carrying sleeve 3. Electric contacting wires 58 and 59 are connected to the brushes 49 and 50 respectively and provide means for contacting an electric energizing current to the motor 16.

In operation, the improved grinding machine, just described, is mounted upon a suitable carrying table, and the grinding wheel 15 is adjusted, by means of the crank handle 25 and the shaft 24, until the radius of the circle in which it will travel, by rotation of the carrier sleeve 3, is set to properly engage the circular surface to be ground, such as the inner wall of a cylinder of an internal combustion engine. The power is then supplied to the grinding machine which rotates the carrier sleeve 3 and consequently revolves the grinding wheel 5 about the axis of the carrier sleeve and the grinding wheel 15 is rotated upon its axis by rotation of the shaft 14 from the motor 16 and thus the rotating grinding wheel is moved in a circular path at a predetermined speed over the surface to be ground, resulting in even and accurate grinding of the said surface.

It is preferable to provide a motor 16 which will rotate the grinding wheel 15 at a much greater speed than the speed of rota-

tion of the carrier sleeve 3, the speed of which is reduced from the speed of the power shaft or supplied by the proportions of the worm gear 4 and worm 6.

It is, of course, to be understood that the invention may be constructed in various other manners and the parts associated in different relations and, therefore, I do not desire to be limited in any manner except as set forth in the claims hereunto appended.

Having thus described my invention what I claim is:

1. In a grinder, a carrier, means for rotating said carrier, a grinding wheel carried by said carrier and movable therewith for moving the grinding wheel over a circular surface to be ground, and adjustable means supporting said grinding wheel for moving it radially from or towards the axis of rotation of the carrier, a motor for rotating said grinding wheel carried by said carrier, spaced contact rings carried by said motor, contact brushes engaging said rings, and adjustable means supporting said brushes to maintain operative engagement of the brushes and rings upon operation of said first named adjustable means.

2. In a grinder, a carrier sleeve, means for rotating said sleeve, blocks adjustable radially of the axis of said sleeve and adapted to be revolved about the axis of the sleeve upon rotation thereof, a shaft carried by said blocks, a grinding wheel on one end of said shaft, a motor upon the opposite end of said shaft for rotating said grinding wheel independently of rotation of said sleeve, spaced contact rings carried by said motor, contact brushes engaging said rings, adjustable means supporting said brushes to maintain operative engagement of the brushes and rings upon adjustment of said blocks, and means connected to said blocks for adjusting the position of said shaft radially of the axis of said carrier sleeve for regulating the radius of the circle in which the shaft and grinding wheel are moved by rotation of the sleeve.

In testimony whereof I affix my signature.

HENRY KOSMOS.