V. B. MOORE.

MACHINE CONSTRUCTION.

APPLICATION FILED OCT. 24, 1919.

1,374,599.

Patented Apr. 12, 1921.

2 SHEETS—SHEET 1.

Fig. 1

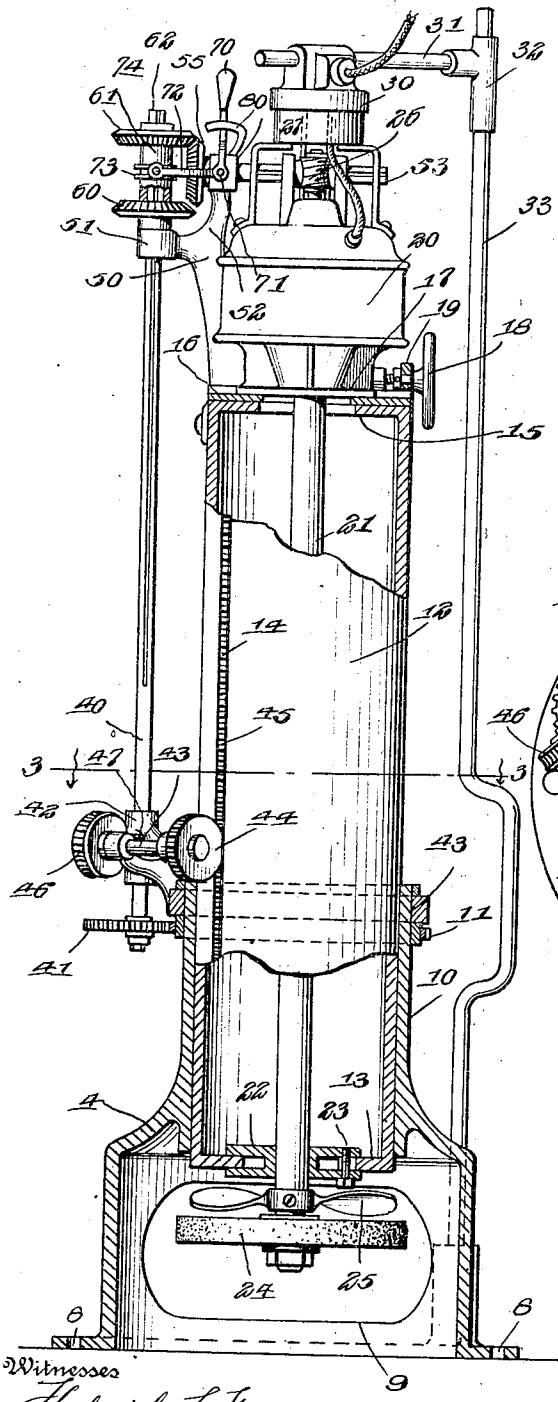
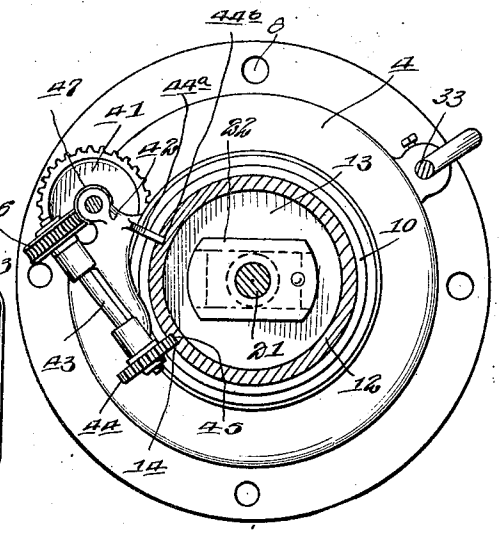


Fig. 3.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 2.

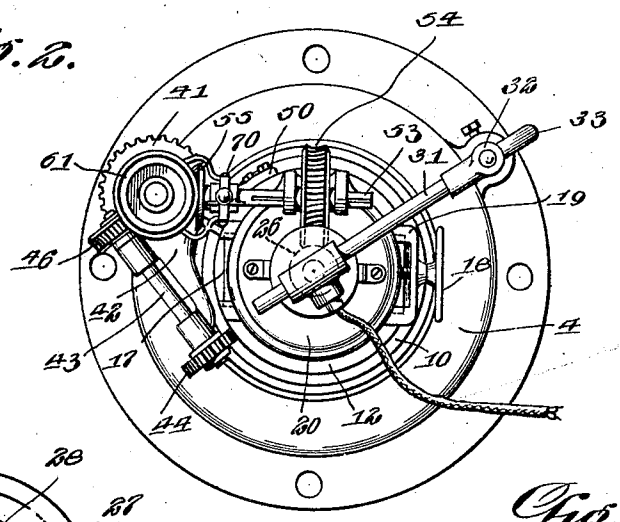


Fig. 4.

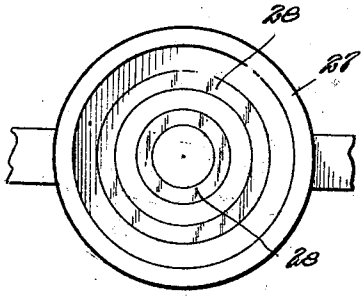


Fig. 7.

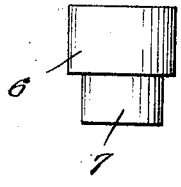
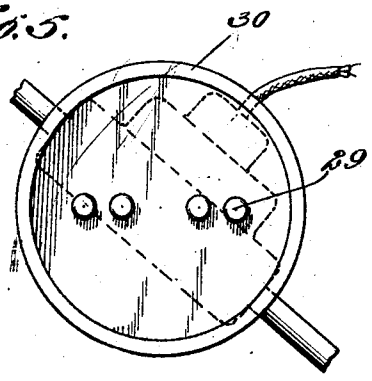
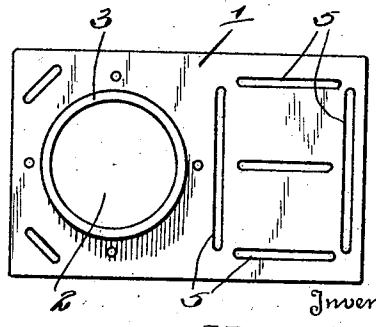


Fig. 6.

Fig. 5.





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UNITED STATES PATENT OFFICE.

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MACHINE CONSTRUCTION.

1,374,599 Specification of Letters Patent. Patented Apr. 12, 1921.

Application filed October 24, 1919. Serial No. 332,989.

To all whom it may concern:

Be it known that I, VERNON B. MOORE, a citizen of the United States, residing at Asheville, in the county of Buncombe and State of North Carolina, have invented new and useful Improvements in Machine Construction, of which the following is a specification.

One object of my present sole invention is the provision of a highly useful organized mechanism in a single unit, designed more especially for grinding the bores of the cylinders of automobile internal combustion engines.

Another object is the provision of improved means in the form of appurtenances to the grinding unit for facilitating the accurate alinement of the unit with cylinders to be ground.

To the attainment of the foregoing, the invention consists in the improvement as hereinafter described and definitely claimed.

In the accompanying drawings, hereby made a part hereof:

Figure 1 is a view, partly in vertical section and partly in side elevation of the machine constituting the best practical embodiment of my invention that I have as yet devised.

Fig. 2 is a plan view of the same.

Fig. 3 is a horizontal section, taken in the plane indicated by the line 3—3 of Fig. 1, looking downwardly.

Fig. 4 is a detail plan view of the rotary member of the collector supplying electrical current to the motor.

Fig. 5 is an inverted plan view of the stationary member equipped with contacts opposed to the collector rings and designed to be connected with a source of electrical energy.

Fig. 6 is a plan view of the plate for alining the grinding machine with a cylinder to be ground.

Fig. 7 is a detail view of one of the gages for positioning the plate shown in Fig. 6 relatively to the cylinder to be ground; the invention contemplating the employment of a number of gages of the kind stated, but with reduced portions of different diameters and adapted to be socketed temporarily in cylinders of different sizes incidental to the positioning of the plate shown in Fig. 6.

Similar numerals of reference designate corresponding parts in all of the views, of the drawings.

The plate 1 shown in Fig. 6 is provided with a circular opening 2 surrounded by an upstanding flange 3 of a diameter to snugly fit in the supporting frame 4 of the grinding machine or unit. Said plate 1 is also provided with a plurality of slots 5 to receive bolts on an engine, so that after proper adjustment, the flange 3 may be alined with the bore of the particular cylinder that is to be interiorly ground. In positioning the flange 3 in the manner described, a gage 6, such as shown in Fig. 7, is employed; the said gage having a reduced portion 7, of a diameter to snugly fit in the cylinder, and the upper portion of the gage being of a diameter to fully occupy the flanged opening 2 in plate 1. Obviously after the plate 1 is positioned with the assistance of the gage 6, the said gage 6 is lifted out of the cylinder and the opening 2, and then the support 4 is placed on the plate 1 and around the flange 3, and is bolted to the plate 1 and the engine at the points 8, indicated in Fig. 1. In its opposite sides the support 4 is provided with openings 9. It will also be noted, by reference to Figs. 1 and 3, that the support 4 is provided with an upstanding cylindrical portion 10 that is open at its lower and upper end; also, that surrounding and fixed to the said cylindrical portion 10 is an annular gear 11.

Movable vertically and also about its vertical axis in the cylindrical portion 10 of the support 4, is a hollow cylindrical body 12 that constitutes an important feature of my invention. At its lower end said body 12 is provided with an inwardly directed flange 13, and at its outer side said body 12 is provided with a vertical rack 14. The upper end of the body 12 is also provided with an inwardly directed flange 15.

Superimposed upon the upper end of the body 12 is a slide rest 16, disposed diametrically of said body, and adjustable diametrically of the body 12 in the said slide rest 16 is a slide 17, designed to be adjusted and

adjustably fixed through the medium of a hand screw 18, that bears in an upright end portion 19 of the slide rest.

Mounted on the slide 17 is an electrical motor 20, the armature shaft 21 of which is extended downwardly through the body 12 and is journaled adjacent to its lower end in a horizontally adjustable bearing 22 that is supported on the body flange 13, and is adjustably fixed to said flange through the medium of a screw 23. Below the bearing 22, the shaft 21 is equipped with a grinding disk 24 and a fan 25 to displace grindings; the said disk 24 being removably fastened on the shaft for obvious reasons. It will be noted here that through the medium of the screw 18, the slide 17, the motor 20 and the motor shaft 21 may be adjusted to present the periphery of the disk 24 to the wall of the cylinder that is to be bored; also, that the screw 23 coöperates with the hand screw 18 in adjustably fixing the said parts to hold the disk 24 to its work. Above the casing of the motor 20, the shaft 21 is equipped with a worm 26, for a purpose hereinafter set forth, and above the said worm 26 the body 12 is provided with a collector member 27, having conductive rings 28, as shown in Fig. 4. The said collector member 27 rotates, of course, with the body 12 and its rings are opposed to contacts 29 that are carried by an upper non-rotatable member 30, Figs. 1, 2 and 5, and are adapted to be connected in the ordinary well known manner with a source of electrical energy. The stationary member 30 of the collector is mounted on an arm 31; said arm having a vertically disposed sleeve 32 that slides loosely on an upright guide rod 33, so that the collector member 30 may be maintained in proper relative position irrespective of the vertical movements of the cylindrical body 12.

I will now describe the peculiar and advantageous driving connections for turning the cylindrical body 12 about its axis and for vertically translating the said body 12. The first of said connections includes an upright shaft 40 having at its lower end a spur gear 41 intermeshed with the fixed annular gear 11. The said shaft 40 is journaled in a bracket 42, carried by a ring 43 that is adapted to turn about the upright cylindrical portion 10 of the support 4, and is supported by the gear 11 and suitably retained in position. Journaled in the bracket 42 is a shaft 43 on which is a spur gear 44 that enters a vertical groove 45 in the body 12 and intermeshes with the teeth of the rack 14 in said groove 45. Manifestly the arrangement of the gear 44 in the groove 45 will cause the cylinder 12 to turn about its axis with the ring 43 and the bracket 42, when the said ring 43 is turned about the cylinder portion 10 by rotation of the shaft 40 and gear 41, and the engagement between the latter and the annular gear 11. The driving connection to translate the body 12 includes the shaft 43, the spur gear 44, a worm gear 46 fast on the shaft 43, and a worm 47 fast on the shaft 40 and intermeshed with the gear 46. Manifestly rotation of the shaft 43 in one direction will be attended by upward movement of the body 12, and rotation of the shaft 43 in the opposite direction will be attended by downward movement of said body 12. At 44^a the bracket 42 is movable vertically in a groove 44^b of body 12 to assist in the turning of the body 12.

As best shown in Fig. 1, the cylindrical body 12 carries a bearing bracket 50 with a horizontal arm 51 and an upright arm 52. The shaft 40 is journaled in the arm 51, and in the arm 52 is journaled a horizontal shaft 53 on which is splined a worm gear 54 that is intermeshed with the worm 26. Thus the shaft 53 is rotated from the armature shaft 21 of the motor. At its outer end said shaft 53 is equipped with a miter gear 55.

The bracket bearing 50 being carried by the slide 17, and said slide being supported on and movable vertically with the body 12, it follows that the shaft 40 must be capable of vertical movement through the bracket arm 51. Therefore for the transmission of rotary motion to the shaft 40, irrespective of the vertical movements of said shaft, I provide at opposite sides of the gear 55 miter gears 60 and 61 splined to the shaft 40 or otherwise associated therewith, so that rotation of the said gears 60 and 61 will always be attended by rotation of the shaft 40. The said gears 60 and 61 are connected together and movable vertically, so that either may be placed in engagement with the gear 55 for the rotation of the shaft 40 in one direction, and so that when desired both of the gears 60 and 61 may be disengaged from gear 55, as when it is desired to turn the shaft 40 by hand through the medium of a crank or wrench applied to the upper angular end 62 of shaft 40. For the convenient adjustment and adjustable fixing of the gears 60 and 61, I provide the angular lever 70 pivotally mounted at 71 on the bearing arm 52 and having the outwardly reaching arms 72 connected to the circumferentially grooved portion 73 on the sleeve 74 that is interposed between and fixed to the gears 60 and 61.

It will be apparent from the foregoing that in the practical operation of my novel grinding machine or unit, the machine may be accurately positioned relatively to a cylinder to be ground, and that the grinding disk 24 may be moved horizontally to place its periphery in engagement with the cylinder wall, and may as readily be adjustably fixed. It will also be noted at this point

that the disk 24 may be nicely adjusted horizontally as the work progresses. Then when the motor is put in operation, the cylindrical body 12 will be moved downwardly and about its axis at one and the same time, or if desired, the body 12 may be simultaneously raised and rotated about its axis. Again when the gears 60 and 61 are neutral—*i. e.*, both are secured out of engagement with the gear 55—the body 12 may be slowly translated and rotated about its axis at one and the same time by hand, through the medium of a crank or wrench applied to the upper angular end of the shaft 40.

For the purpose of adjustably fixing the lever 70, I prefer to provide the segmental rack 80 that is carried by the bracket arm 52 and is possessed of more or less resiliency, so that the lever 70 may be sprung into and out of its seats.

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

1. The combination of a support having a cylindrical portion, an annular gear surrounding and fixed to said portion, a cylindrical body arranged to be translated and turned about its axis in said portion and having a longitudinal groove in its outer side and a rack in said groove, a ring mounted to turn about said portion and having a bracket, a shaft mounted in the bracket and having a spur gear intermeshed with said annular gear and also having a worm, and a shaft turning in the bracket and having a worm gear intermeshed with said worm and also having a spur gear that enters the groove in the cylindrical body and engages the rack, whereby when the first-named shaft is rotated the cylindrical body will be turned about its axis and translated.

2. A machine construction comprising a support having an upstanding cylindrical portion, an annular gear surrounding and fixed to said cylindrical portion, a cylindrical body arranged to be translated and turned about its axis in said cylindrical portion of the support and having a vertical groove in its outer side and a rack in said groove, a ring mounted to turn about the cylindrical portion of the support and having a bracket, a shaft mounted in the bracket and having a spur gear intermeshed with said annular gear and also having a worm, a motor on the body and connected with the said shaft, and a shaft turning in the bracket and having a worm gear intermeshed with said worm and also having a spur gear that enters the groove in the cylindrical body and engages the rack.

3. A machine construction comprising a support having an upstanding cylindrical portion, an annular gear surrounding and fixed to said cylindrical portion, a cylindrical body arranged to be translated and turned about its axis in said cylindrical portion of the support and having a vertical groove in its outer side and a rack in said groove, a ring mounted to turn about the cylindrical portion of the support and having a bracket, a shaft turning in the bracket and having a spur gear intermeshed with said annular gear and also having a worm, a shaft turning in the bracket and having a worm gear intermeshed with said worm and also having a spur gear that enters the groove in the cylindrical body and engages the rack, a motor supported on and movable with the cylindrical body and having a shaft extending downwardly in the body, said motor and its shaft being laterally adjustable, means to adjustably fix the motor and shaft, and a driving connection between the motor and the first-named shaft.

4. A machine construction comprising a support having an upstanding cylindrical portion, an annular gear surrounding and fixed to said cylindrical portion, a cylindrical body arranged to be translated and turned about its axis in said cylindrical portion of the support and having a vertical groove in its outer side and a rack in said groove, a ring mounted to turn about the cylindrical portion of the support and having a bracket, a shaft mounted in the bracket and having a spur gear intermeshed with said annular gear and also having a worm, a shaft turning in the bracket and having a worm gear intermeshed with said worm and also having a spur gear that enters the groove in the cylindrical body and engages the rack, an electric motor supported on and movable with the cylindrical body and also movable laterally of said body, means to adjustably fix the motor relatively to the body; the armature shaft of the motor extending downwardly and upwardly therefrom, a worm on the upper portion thereof, current collecting means above the motor and movable vertically with the same, a bearing on the cylindrical body, and loosely receiving the first-named shaft, miter gears spaced apart and connected together and splined on the first-named shaft, means to adjust and adjustably fix said miter gears, and a shaft having a worm gear intermeshed with the worm on the armature shaft and also having a miter gear adapted to be alternately engaged by the first-named miter gears.

5. The combination of a support having a cylindrical portion, an annular gear surrounding and fixed to said portion, a cylindrical body arranged to be translated and turned about its axis in said portion and having a longitudinal groove in its outer side and a rack in said groove, a ring mounted to turn about said portion and having a bracket, a shaft mounted in the bracket and having a spur gear intermeshed with said annular

gear and also having a worm, and a shaft turning in the bracket and having a worm gear intermeshed with said worm and also having a spur gear that enters the groove in the cylindrical body and engages the rack, whereby when the first-named shaft is rotated the cylindrical body will be turned about its axis and translated and a motor on the body and connected with the first-named shaft, said connection being adapted to be disconnected to permit of manual rotation and endwise movement of the body through the medium of the first-named shaft.

In testimony whereof I affix my signature.

VERNON B. MOORE.