R. G. SEDGEWICK.

VALVE GRINDER.

APPLICATION FILED OCT. 1, 1919.

1,372,045.

Patented Mar. 22, 1921.

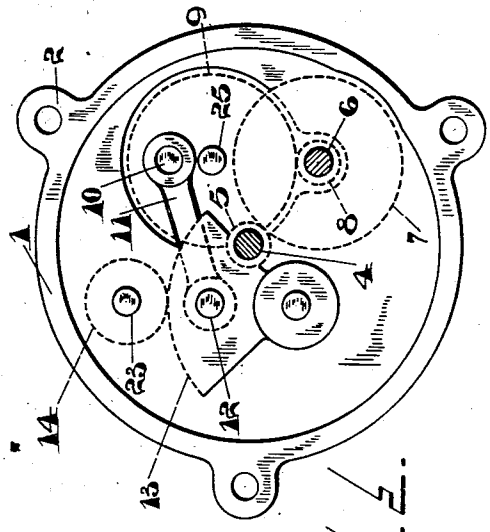


Fig. 2.

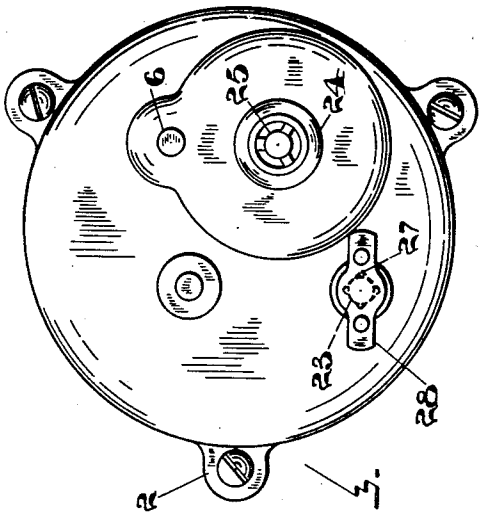
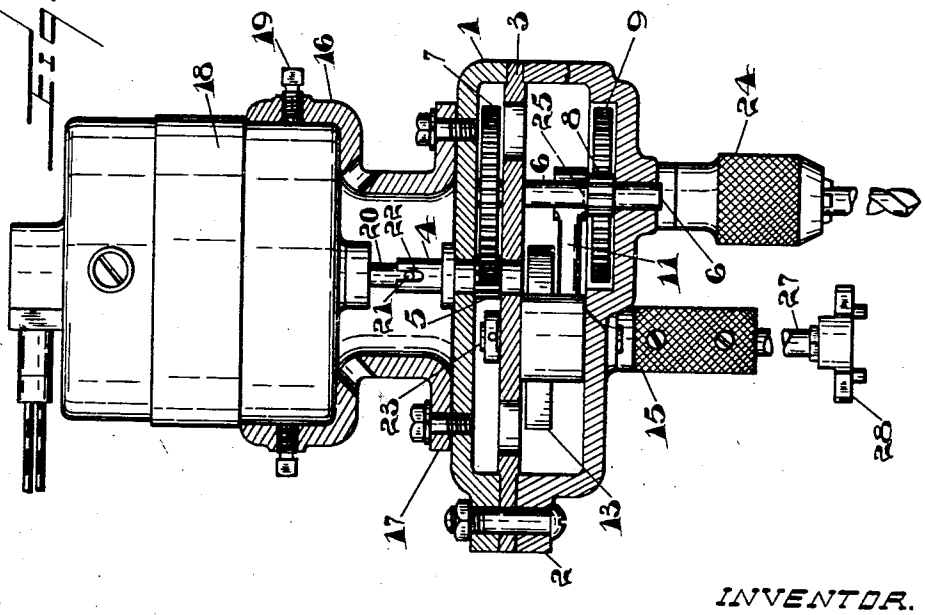


Fig. 3.

Fig. 1.



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UNITED STATES PATENT OFFICE.

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VALVE-GRINDER.

1,372,045. Specification of Letters Patent. Patented Mar. 22, 1921.

Application filed October 1, 1919. Serial No. 327,802.

To all whom it may concern:

Be it known that I, RUSSELL GLADSTONE SEDGEWICK, of the city of Toronto, in the county of York, Province of Ontario, Canada, have invented certain new and useful Improvements in Valve-Grinders, of which the following is a specification.

In grinding in the valves of internal combustion motors, it is necessary to impart an oscillating rotary motion to the valve. This is usually done by hand and the process is hard and tedious. My object therefore is to devise a power machine, small enough to be easily handled, for imparting the desired motion to the valve.

I attain my object by means of the constructions hereinafter described and illustrated in the accompanying drawings in which—

Figure 1 is a vertical section of my improved grinder;

Fig. 2 a plan view with the upper part of the casing and the adapter removed; and

Fig. 3 a plan view of the under side of the casing.

In the drawings like numerals of reference indicate corresponding parts in the different figures.

1 is a casing, preferably circular in plan or otherwise suitably shaped to support the different parts. This casing is divided and the parts are secured together by means of bolts passing through the lugs 2. Between the parts is clamped the rim of a circular plate 3 in which parts of the gearing have their bearings.

In the upper part of the casing and in the plate 3 is journaled a spindle 4 carrying within the casing a pinion 5. The upper end of this spindle 4 is adapted for connection with a motor spindle as hereinafter described. In the top and bottom of the casing and in the plate 3 is journaled a spindle 6 to which is secured a gear wheel 7 meshing with the pinion 5. The lower end of this spindle carries a pinion 8 which meshes with a gear wheel 9 provided with a spindle 25 suitably journaled in the under side of the casing. The casing is preferably recessed to receive the pinion and gear so that the upper sides thereof are flush with the main part of the inner surface of the lower part of the casing. To the gear wheel 9 is secured a wrist pin 10 on which is journaled one end of a connecting rod 11. The other end of this connecting rod is pivotally connected with a wrist pin 12 secured to a segmental gear 13 suitably journaled in the casing. The distance between the center of the gear wheel 9 and the center of the wrist pin 10 is less than the distance between the center of the wrist pin 12 and the center of the segmental gear 13. Consequently, a rotary movement of the gear wheel 9 is converted into an oscillatory rotary movement of the segmental gear wheel 13. This segmental gear wheel meshes with a pinion 14 journaled in the lower part of the casing and the plate 3. The pinion 14 is secured to a spindle 23 journaled in the casing and the plate 3. The lower end of this spindle 23 extends out through the bottom of the casing and is provided with the chuck 15 of any suitable type adapted to carry any tool for engagement with the valve to be ground in. The gearing is so proportioned that if the spindle 4 be continuously rotated the chuck 15 will be given an oscillatory rotary movement of a little over 180° in either direction, the speed of course depending on the speed at which the spindle 4 is driven. Very convenient means are thus provided for imparting the desired oscillatory rotary movement to the valve to be ground in.

To drive the spindle 4 I provide a motor which will usually be a small electric motor and this motor I secure to the casing 1 by means of an adapter 16 which is provided with a flange 17 bolted to the top of the casing 1. The upper part of this adapter is formed as a cylindrical socket to receive part of the casing 18 of the electric motor, which casing is held in position by set screws 19 threaded through the rim of the adapter. The motor spindle 20 has a transverse pin 21 fitted therein adapted to engage in longitudinal slots 22 formed in the end of the spindle 4, this spindle being bored out to receive the end of the motor spindle. When the motor is withdrawn from the adapter, its spindle readily disengages from the spindle 4. For certain purposes it is desirable to have continuous rotary movement. I therefore extend one of the other spindles out through the under side of the casing, for example, the spindle 25 and provide its lower end with a chuck 24 adapted to hold a drill or other tool. The device is thus adapted for many other purposes in a repair shop other than the grinding in of valves.

As it is important that the pressure of the device should be evenly supported by the valve, I introduce some flexibility in the connection between the device and the valve. The preferred arrangement is shown in Figs. 1 and 3 of the drawings. A bit 27 with a squared end is fitted in the chuck 15. Its other end is squared and fitted in a similar socket in the valve engaging tool 28. There will be slight play of the bit in the socket and as the socket is central, the pressure of the grinder will be evenly distributed on the valve even though the grinder be not held with the chuck in perfect alinement with the valve stem. This arrangement also facilitates the connection of the device with the valve.

What I claim as my invention is:—

1. A valve grinding device comprising a casing; a spindle journaled therein carrying a tool-holding chuck; a rotary motor carried by the casing; a spindle journaled in the casing having a driving connection with the motor; a pinion on the motor driven spindle; a gear wheel with which the pinion meshes; an intermediate spindle journaled in the casing and to which the gear wheel is secured; a pinion on the intermediate spindle; a gear wheel journaled in the casing and meshing with said pinion; a wrist pin extending up from said gear wheel; a segmental gear journaled in the casing; a wrist pin extending down from said segmental gear; a connecting rod lying between said gear wheel and segmental gear and connecting the wrist pins; and a pinion on the chuck carrying spindle meshing with the segmental gear, the wrist pins being positioned to cause the segmental gear to be given an oscillating rotary motion.

2. A valve grinding device comprising a casing; a spindle journaled therein carrying a tool holding chuck; a second spindle journaled in the casing; gearing between the two spindles; a motor; an adapter secured to the casing and adapted to receive the motor casing; and a motor spindle detachably coupled to the second spindle aforesaid.

3. A valve grinding device comprising a casing; a spindle journaled therein carrying a tool-holding chuck; a rotary motor carried by the casing; a spindle journaled in the casing having a driving connection with the motor; a pinion on the motor driven spindle; a gear wheel with which the pinion meshes; an intermediate spindle journaled in the casing and to which the gear wheel is secured; a pinion on the intermediate spindle; a gear wheel journaled in the casing and meshing with said pinion; a wrist pin on said gear wheel; a segmental gear journaled in the casing; a wrist pin on the segmental gear; a connecting rod connecting the wrist pins; and a pinion on the chuck-carrying spindle meshing with the segmental gear, the wrist pins being positioned to cause the segmental gear to be given an oscillating rotary motion; and a chuck secured to the lower end of one of the intermediate spindles.

4. A valve grinding device comprising a casing consisting of two halves; a plate supported intermediate the top and bottom of said casing; a spindle carrying a tool holding chuck journaled in the bottom of said casing and in said plate; a second spindle journaled in the top of said casing and in said plate; a motor; a spindle journaled in the casing having a driving connection with the motor; and gearing for converting the rotary motion of the motor driven spindle into oscillating rotary motion of the chuck carrying spindle.

5. A valve grinding device comprising a casing consisting of two halves; a plate supported intermediate the top and bottom of said casing; a spindle carrying a tool holding chuck journaled in the bottom of said casing and in said plate; a second spindle journaled in the top of said casing and in said plate; a pinion on the motor driven spindle; a gear wheel with which the pinion meshes; an intermediate spindle journaled in the bottom of said casing and in said plate and to which the gear wheel is secured; a pinion on said intermediate spindle; a gear wheel journaled in the casing and meshing with said pinion; a wrist pin on said gear wheel; a segmental gear journaled in the casing; a wrist pin on the segmental gear; a connecting rod connecting the wrist pins; and a pinion on the chuck carrying spindle meshing with the segmental gear, the wrist pins being positioned to cause the segmental gear to be given an oscillating rotary motion.

6. A valve grinding device comprising a casing consisting of two halves each half provided with lugs; a plate provided with lugs and supported intermediate the top and bottom of said casing; means provided to secure said halves of casing and said plate through said lugs; a spindle carrying a tool holding chuck journaled in the bottom of said casing and in said plate; a second spindle journaled in the top of said casing and in said plate; a motor; a spindle journaled in the casing having a driving connection with the motor; and gearing for converting the rotary motion of the motor driven spindle into oscillating rotary motion of the chuck carrying spindle.

Signed at Toronto, Canada, this 19th day of Sept., 1919, in the presence of the undersigned witness.

RUSSELL G. SEDGEWICK.

Witness:

J. EDW. MAYBEE.