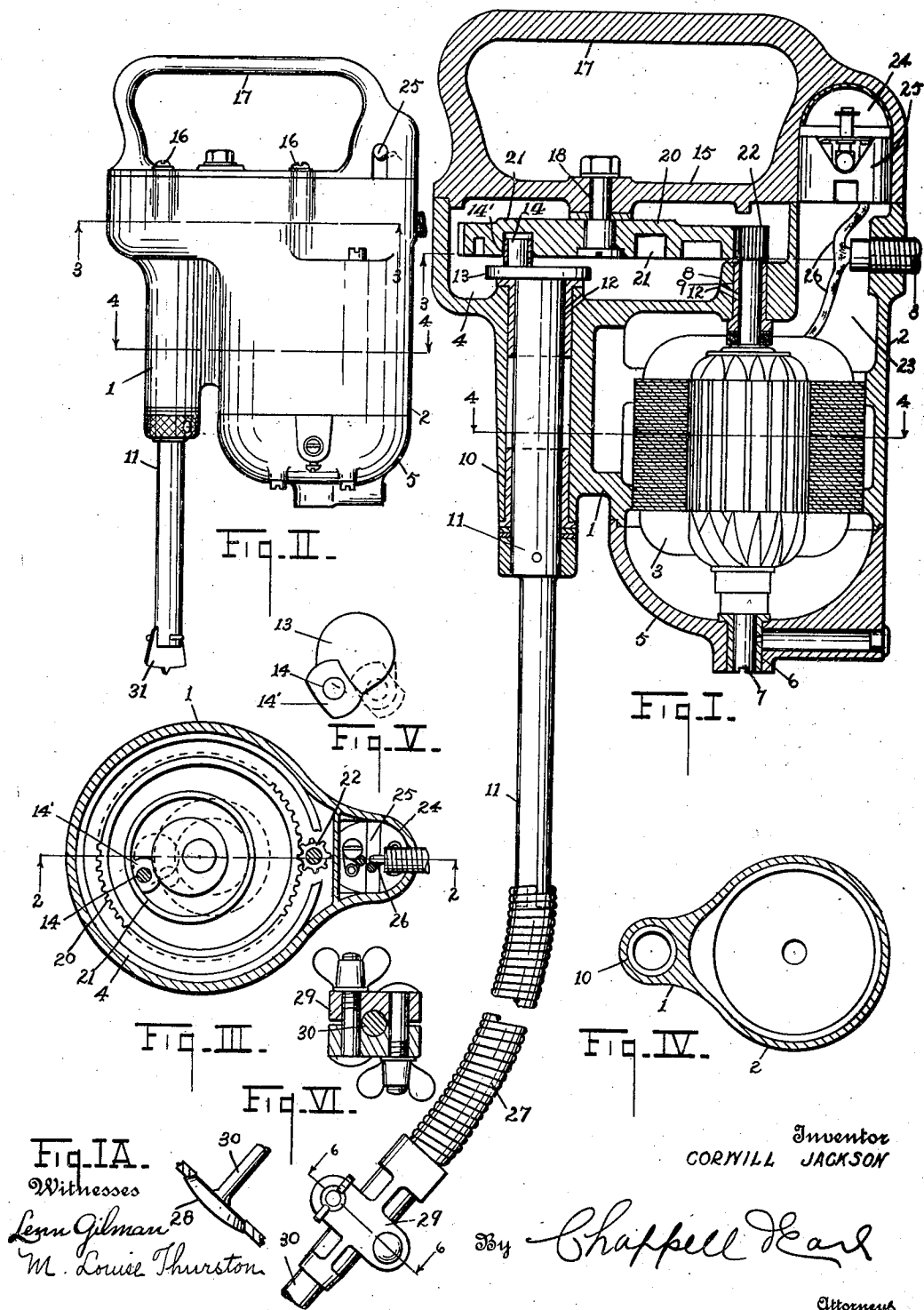


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UNITED STATES PATENT OFFICE.

CORWILL JACKSON, OF KALAMAZOO, MICHIGAN.

GRINDER.

1,346,893.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CORWILL JACKSON, a citizen of the United States, residing at the city and county of Kalamazoo, State of Michigan, have invented certain new and useful Improvements in Grinders, of which the following is a specification.

This invention relates to improvements in grinders.

My improved grinder is especially designed by me as a valve grinder for internal combustion engines although desirable for use in other relations.

The main objects of this invention are:

First, to provide an improved motor driven grinder which is at the same time compact and easily manipulated.

Second, to provide an improved grinder adapted for the grinding of valves that seat inwardly or those that seat outwardly and also those which are not directly accessible.

Third, to provide an improved grinder in which the parts are comparatively simple in structure and very readily assembled.

Further objects, and objects relating to structural details, will definitely appear from the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification.

The invention is clearly defined and pointed out in the claims.

A structure which is a preferred embodiment of my invention is clearly illustrated in the accompanying drawing, forming a part of this specification, in which:

Figure I is a detail view of a structure embodying the features of my invention mainly in longitudinal section on a line corresponding to line 1—1 of Fig. III.

Fig. I^A is a detail view of an internal combustion engine, the parts being shown conventionally.

Fig. II is a side elevation of the structure shown in Fig. I with the flexible extension of the spindle omitted, the spindle being provided with a blade adapted to engage the slot-like recess present in certain types of internal combustion engine valves.

Fig. III is a transverse section on a line corresponding to line 3—3 of Figs. I and II.

Fig. IV is a transverse section on a line corresponding to line 4—4 of Figs. I and II, the motor and spindle being omitted.

Fig. V is a plan view of the spindle crank.

Fig. VI is an enlarged detail section

through the spindle chuck on a line corresponding to line 6—6 of Fig. I.

In the drawing, similar reference characters refer to similar parts throughout the several views, and the sectional views are taken looking in the direction of the little arrows at the ends of the section lines.

Referring to the drawing, I provide a frame or support comprising a body member 1 having a chamber or housing 2 therein for the motor 3, shown mainly in conventional form. The body member 1 also has a recess-like chamber or gear box 4 in its upper end. The motor chamber is open at its lower end so that the motor may be introduced through the bottom of the housing.

The bottom member 5 is removably secured in position and is provided with a bearing 6 for the lower end of the motor or driving shaft 7. The wall 8 between the gear box and the motor housing is provided with a bearing 9 for the upper end of the motor shaft. At one side of the motor chamber is a bearing 10 for the spindle 11. The bearings 9 and 10 have lubricant passages 12 communicating with the gear box which is adapted as a lubricant receptacle.

On its upper end the spindle is provided with a crank 13 having a crank or wrist pin 14 thereon. The top member 15 is removably secured by means of the screws 16 and constitutes a top for the gear box. This top member is provided with a handpiece 17. The top member 15 carries a stub shaft 18 disposed at one side of or out of alignment with the spindle. On this stub shaft is a gear 20 having an eccentric groove 21 in its face coacting with the crank pin 14 so that as the gear is revolved an oscillating movement is communicated to the spindle. The crank pin has the segmental bearing shoe 14' traveling in the eccentric, the shoe being of advantage over a runner in this relation in that it presents a substantial wearing surface.

The driving or motor shaft projects into the gear box and has a pinion 22 on its projecting end meshing with the gear 20. The motor housing or chamber 2 has a passage 23 with which the recess 24 in the top member registers forming a housing for the switch 25 and the electrical connection 26. These parts are conventionally shown as they form no part of my present invention.

For the grinding of valves which may be located in an angular relation to the posi-

tion in which it is possible or desirable to hold the spindle, the spindle is provided with a flexible extension 27 in the form of a coiled spring of such strength as would be
 5 suitable for driving purposes and at the same time permit flexing as shown in Fig. I. This spring is also of advantage in the grinding of valves 28 of the type which seat
 10 outwardly, as shown conventionally in Fig. I^A, as it permits an outward pull on the spindle without likelihood of injuring the valve or valve seat where they are somewhat delicate, as is the case in certain aero-
 plane motors.

15 A chuck 29 is provided for the flexible extensions 27, this chuck being of a clamping type adapted to be clamped upon the stem 30 of the valve.

20 In Fig. II I show my improved grinder with the extension 27 removed and a blade 31 suitable for engagement with the slot-like recess of valves of a common type.

My improved grinder is compact in structure and it is so constructed and arranged
 25 that it is capable of very convenient manipulation.

I have illustrated and described my improvements in an embodiment designed for use in grinding valves for internal combustion engines. Certain features are, as
 30 stated, capable and desirable for embodiment in other relations.

I have not attempted to illustrate or describe certain embodiments or adaptations
 35 as I believe the disclosure made will enable those skilled in the art to which my invention relates to embody or adapt the same as may be desired.

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

1. The combination of a frame comprising a body member provided with a motor housing and a gear box, a removable bottom member for said motor housing permitting the insertion and removal of the motor from the bottom of the housing, and a top member constituting a cover for said gear box and provided with a handpiece, a spindle bearing at the side of the said housing and a shaft bearing in the wall between said motor housing and gear box, there being a second shaft bearing in said bottom member, a motor provided with a shaft disposed
 50 in said shaft bearings to project into said gear box, a pinion on the projecting end of said shaft, a stub shaft mounted on said top member out of alinement with said spindle bearing, a gear on said stub shaft meshing
 60 with said pinion and having an eccentric on its face, and a spindle disposed in said spindle bearing and provided with a crank coacting with said eccentric whereby on the rotation of the gear an oscillatory movement
 65 is imparted to the spindle.

2. The combination of a frame comprising a body member provided with a motor housing and a gear box, and a top member constituting a cover for said gear box and provided with a handpiece, a spindle bearing at the side of the said housing and a shaft bearing in the wall between said motor housing and gear box, a motor provided with a shaft disposed in said shaft bearing to project into said gear box, a pinion on the projecting end of said shaft, a stub shaft mounted on said top member out of alinement with said spindle bearing, a gear on said stub shaft meshing with said pinion and having an eccentric on its face, and a spindle disposed in said spindle bearing and provided with a crank coacting with said eccentric whereby on the rotation of the gear an oscillatory movement is imparted to the spindle.

3. The combination of a frame comprising a body member provided with a motor housing and a gear box, said gear box being adapted to contain and supply lubricant to said bearings, a motor provided with a shaft disposed in said shaft bearing to project into said gear box, a pinion on the projecting end of said shaft, a stub shaft disposed out of alinement with said spindle bearing, a gear on said stub shaft meshing with said pinion and having an eccentric on its face, and a spindle disposed in said spindle bearing and provided with a crank coacting with said eccentric whereby on the rotation of the gear an oscillatory movement is imparted to the spindle.

4. The combination of a frame comprising a body member provided with a motor housing and a gear box, a removable housing bottom member for said motor housing permitting the insertion and removal of the motor from the bottom of the housing, and a top member constituting a cover for said gear box, a spindle bearing at the side of said housing and a shaft bearing in the wall between said housing and gear box, said gear box being adapted to contain and supply lubricant to said bearings, there being a second shaft bearing in said housing bottom member, a motor provided with a shaft disposed in said shaft bearings to project into said gear box, a spindle disposed in said spindle bearing, and driving connections for said shaft and spindle disposed in said gear box.

5. The combination of a frame comprising a body member provided with a motor housing and a gear box, and a top member constituting a cover for said gear box, a spindle bearing at the side of said housing and a shaft bearing in the wall between said housing and gear box, a motor provided with a shaft disposed in said shaft bearing to project into said gear box, a spindle disposed in said spindle bearing, and driving

connections for said shaft and spindle disposed in said gear box.

6. The combination of a frame comprising a body member provided with a motor housing and a gear box, and a top member constituting a cover for said gear box and provided with a handpiece, a spindle bearing at the side of said housing and a shaft bearing in the wall between said housing and gear box, said gear box being adapted to contain and supply lubricant to said bearings, a motor provided with a shaft disposed in said shaft bearing to project into said gear box, a spindle disposed in said spindle bearing, and driving connections for said shaft and spindle disposed in said gear box.

7. The combination of a frame comprising a body member provided with a motor housing and a gear box, and a top member constituting a cover for said gear box and provided with a handpiece, a spindle bearing at the side of said housing and a shaft bearing in the wall between said housing and gear box, a motor provided with a shaft disposed in said shaft bearing to project into said gear box, a spindle disposed in said spindle bearing, and driving connections for said shaft and spindle disposed in said gear box.

8. The combination of a frame comprising a body member provided with a motor housing and a gear box, a motor provided with a shaft projecting into said gear box, a pinion disposed in said gear box on said shaft, a gear meshing with said pinion and having an eccentric on its face, and a spindle disposed with its axis parallel to the axis of said gear provided with a crank coacting with said eccentric whereby on the continuous rotation of the gear an oscillatory movement is imparted to the spindle.

9. In a grinder, the combination of a frame, a gear having an eccentric on its face, a spindle disposed with its axis parallel to and at one side of the axis of the gear and having a flexible coiled spring extension provided with a chuck at its outer end, and a crank coacting with said eccentric so that as the gear is continuously rotated an oscillating movement is imparted to the spindle, means for driving said gear, and a handpiece for said frame whereby pushing or pulling stress may be imparted to the spindle.

10. In a grinder, the combination of a frame, a gear having an eccentric on its face, a spindle disposed with its axis parallel to and at one side of the axis of the gear, and

a crank coacting with said eccentric so that as the gear is continuously rotated an oscillating movement is imparted to the spindle, and means for driving said gear.

11. In a grinder, the combination with a frame, of a spindle carried thereby and provided with a crank, a gear disposed with its axis parallel to the axis of the spindle and having an eccentric on its face coacting with said crank so that on the continuous rotation of the gear an oscillating movement is imparted to the spindle, and a motor on said frame provided with a pinion meshing with said gear.

12. In a grinder, the combination of a frame, a driving shaft, a pinion on said shaft, a gear meshing with said pinion and having an eccentric on its face, and a spindle disposed with its axis parallel to the axis of the gear and provided with a crank coacting with said eccentric whereby on the continuous rotation of the gear an oscillatory movement is imparted to the spindle.

13. In a grinder, the combination with a frame, of a spindle carried thereby and provided with a crank, a gear disposed with its axis parallel to the axis of the spindle and having an eccentric on its face coacting with said crank so that on the continuous rotation of the gear an oscillating movement is imparted to the spindle, and means for driving said gear.

14. In a grinder, the combination with a frame, of a spindle carried thereby and provided with a crank, a gear having an eccentric coacting with said crank, said crank having a segmental bearing shoe engaging said eccentric so that on rotation of the gear an oscillating movement is imparted to the spindle, and means for driving said gear.

15. In a grinder, the combination of a frame adapted to be manually supported and manipulated relative to the work, a spindle on said frame, power means on said frame for oscillating said spindle, a chuck, and a coiled spring between said spindle and chuck adapted to flex, and adapted to yield under excessive resistance to the driving stress on the spindle and to constitute a cushioning member between the frame and the work.

In witness whereof I have hereunto set my hand and seal in the presence of two witnesses.

CORWILL JACKSON. [L.S.]

Witnesses:

LUELLA G. GREENFIELD,
GRACE B. THOMPSON.