

H. F. WATERS.
VALVE GRINDING MACHINE.
APPLICATION FILED MAY 24, 1911.

1,003,832.

Patented Sept. 19, 1911.

3 SHEETS-SHEET 1.

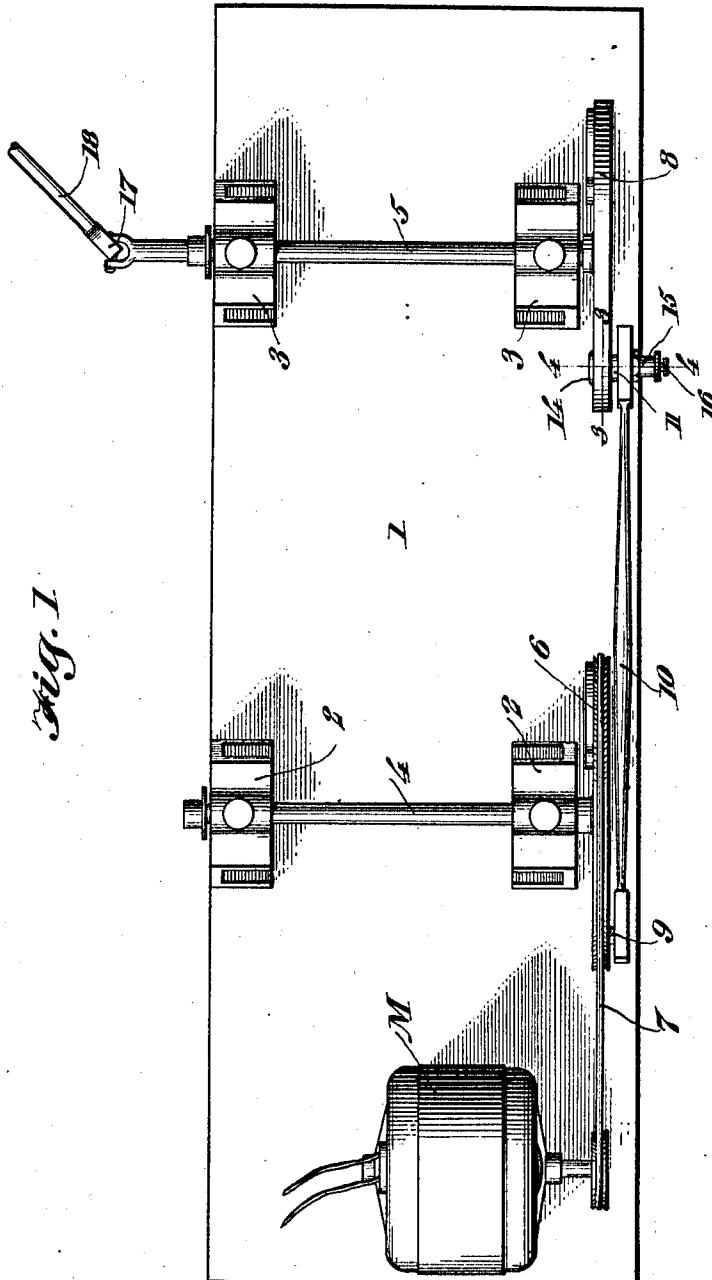


Fig. 1

Inventor
Harry F. Waters

Witnesses
all of cards.
Wm. Bagger

By Victor J. Evans
Attorney

H. F. WATERS.
VALVE GRINDING MACHINE.
APPLICATION FILED MAY 24, 1911.

1,003,832.

Patented Sept. 19, 1911.

3 SHEETS-SHEET 2.

Fig. 2

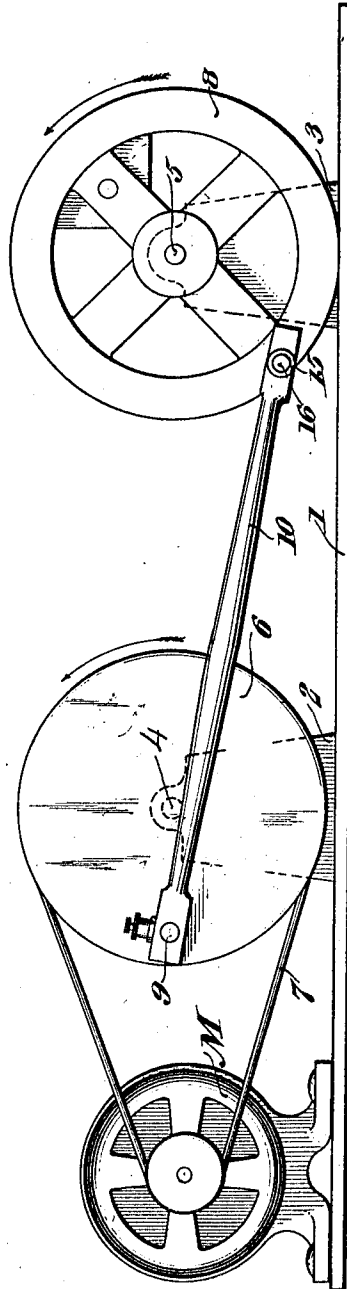
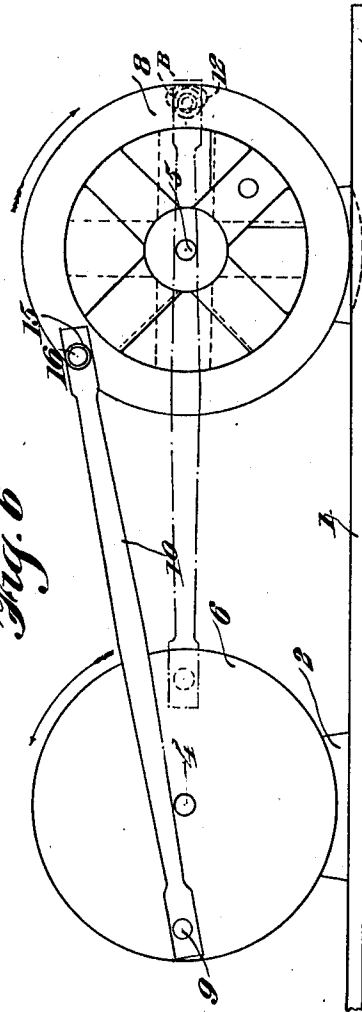


Fig. 6



Witnesses
Allard
Wm. Baggers

Inventor
Harry F. Waters

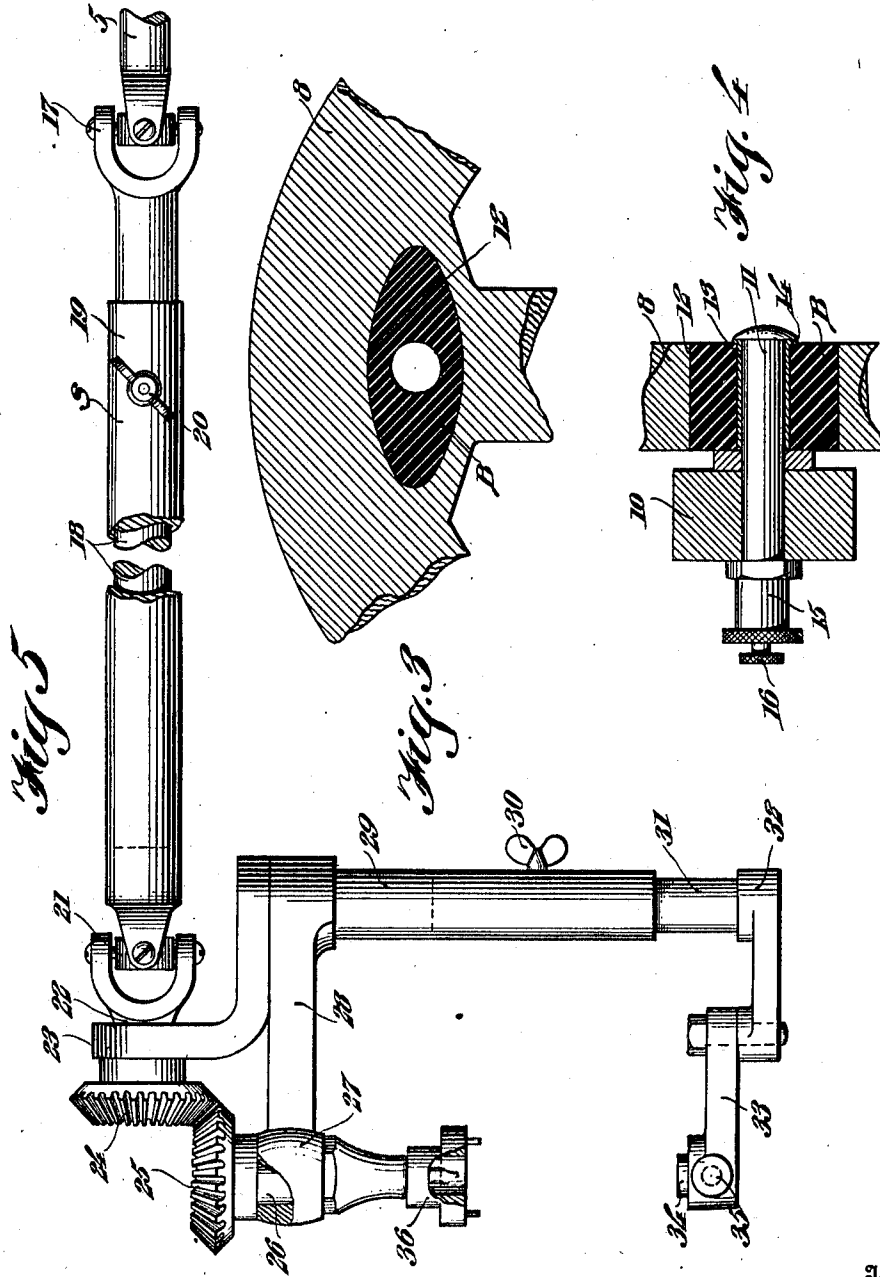
By Victor J. Evans
Attorney

H. F. WATERS.
VALVE GRINDING MACHINE.
APPLICATION FILED MAY 24, 1911.

1,003,832.

Patented Sept. 19, 1911.

3 SHEETS-SHEET 3.



Witnesses

allgades.

Wm. Bagger.

Inventor
Harry F. Waters

By Victor J. Evans

Attorney

UNITED STATES PATENT OFFICE.

HARRY F. WATERS, OF COLORADO SPRINGS, COLORADO.

VALVE-GRINDING MACHINE.

1,003,832.

Specification of Letters Patent.

Patented Sept. 19, 1911.

Application filed May 24, 1911. Serial No. 629,108.

To all whom it may concern:

Be it known that I, HARRY F. WATERS, a citizen of the United States, residing at Colorado Springs, in the county of El Paso and State of Colorado, have invented new and useful Improvements in Valve-Grinding Machines, of which the following is a specification.

This invention relates to valve grinding machines, and it has particular reference to an improved machine for grinding valves on automobile engines.

One object of the invention is to enable valves to be ground without removing the valves from their seats by the use of power furnished by a suitable motor such as an electric motor of ordinary construction.

Another object of the invention is to provide simple and efficient means whereby the approximately three-fourths oscillatory motion of the grinding apparatus, which is desirable in order to produce efficient results, may be obtained without manual operation.

Still further objects of the invention are to simplify and improve the construction and operation of a machine of the character described.

With these and other ends in view which will readily appear as the nature of the invention is better understood, the same consists in the improved construction and novel arrangement and combination of parts which will be hereinafter fully described and particularly pointed out in the claims.

In the accompanying drawings has been illustrated a simple and preferred form of the invention, it being, however, understood that no limitation is necessarily made to the precise structural details therein exhibited, but that changes, alterations and modifications within the scope of the claims may be resorted to when desired.

In the drawings,—Figure 1 is a top plan view of a portion of a machine constructed in accordance with the invention. Fig. 2 is a partial side elevation of the same. Fig. 3 is a sectional detail view, enlarged, taken on the plane indicated by the line 3—3 in Fig. 1. Fig. 4 is a sectional detail view, enlarged, taken on the plane indicated by the line 4—4 in Fig. 1. Fig. 5 is a detail view in side elevation showing the transmission shaft and the brace whereby the valve is held upon its seat while being ground. Fig. 6 is a diagrammatic view

showing a position of the wheels 6 and 8 different from that indicated in Fig. 2.

Corresponding parts in the several figures are denoted by like characters of reference.

A base 1, which may consist of a plank of suitable dimensions, is provided with standards or uprights 2 and 3 affording bearings for shafts 4 and 5. The shaft 4 carries at one end a band wheel 6 which receives motion by a belt or band 7 from a suitable source of power, such as an electric motor of ordinary well known and approved construction, said motor being supported upon the base 1, as shown at M. The shaft 5 carries a wheel 8, the diameter of which may be approximately equal to that of the wheel 6. The wheel 6 is equipped with a wrist pin 9 which is connected by a rod or pitman 10 with a wrist pin 11 upon the wheel 8, the arrangement being such that by the rotation of the wheel 6 an oscillatory motion of approximately three-fourths of a revolution, or extending through an arc of approximately 270 degrees, will be transmitted to the wheel 8. In order that this may be accomplished it is obviously necessary that the axes of the wrist pins 9 and 11 must be nearly equidistant from the axes of the shafts 4 and 5. In order to support the wrist pin 11 in such a manner as to enable the operation to take place, I resort to the special construction illustrated in Figs. 3 and 4 of the drawings, by reference to which it will be seen that the wheel 8 is provided with a slot 12 wherein a packing block B of rubber or equivalent resilient material is tightly fitted. The packing block is apertured for the passage of a sleeve 13 constituting a boxing for the wrist pin and having at its inner end a flange 14, the outer end of said sleeve being engaged by the inner face of the pitman 10 which is connected with the wrist pin by usual well known means, such as a cap nut 15 and a locking and tightening screw 16. Lubricating means of any well known character are to be employed wherever needed.

When the motor is in operation and the wheel 6 is rotated, assuming the wrist pin 9 to start from the position indicated in Fig. 2 at the side of the shaft 4 which is distant from the shaft 5 carrying the wheel 8 in which position the wrist pin 11 may be regarded as being at the limit of its movement in one direction, the wheel 8 will be rotated

in the direction of the arrow at A until the pitman 10 lies in the plane of the axes of the shafts 4 and 5. The dead center occupied by the wrist pin 11 will be overcome by the momentum of the wheel 8, and the rotation of the latter will continue until the position is reached which is illustrated in the diagram, Fig. 6, at which the wheel 6 has accomplished one complete rotation, while the wheel 8 has accomplished approximately three-fourths of a rotation, the wrist pin 11 being now disposed above the plane of the axes of the shafts 4 and 5. The continued movement of the wheel 6 in one direction will now start the wheel 8 in a reverse direction which will continue until the initial position indicated in Fig. 2 is reached, the dead center of the wrist pin 11 being overcome by the momentum of the wheel 8. The elastic packing block B compensates for the slight deviation in distance between the axis of the wrist pin 9 and that of the shaft 4 as compared with the distance between the axis of the wrist pin 11 and that of the shaft 5.

The shaft 5 carrying the wheel 8 is connected by a universal joint 17 with one end of an extension shaft S comprising telescoping members 18 and 19 adjustably connected together by a set screw 20. The opposite end of the extension shaft S is connected by a universal joint 21 with one end of a short shaft 22 which is supported for rotation in a bracket 23 and which carries at its opposite end a bevel gear 24 meshing with a bevel gear 25 upon a vertical shaft 26 which is supported for rotation in a sleeve or bearing 27 carried by an arm or bracket 28, the shafts 22 and 26 being disposed at right angles to one another. The arms or brackets 22 and 28 are carried by a tubular member 29 which is vertically adjustable by means of a set screw 30 upon a support or upright 31 having at its lower end a bracket 32 provided with a swinging arm 33. Said swinging arm carries a supporting block 34 held by a set screw 35. Associated with the lower end of the shaft 26 is a valve carrying head or member 36 which may be connected in any convenient and suitable manner with the valve that is to be ground.

In the operation of this invention the members 29 and 31 and associated parts constitute a brace or clamping device whereby the valve may be forcibly held against its seat while it is being oscillated by the motor means herein described. Abrading and

lubricating material may be readily supplied, and the valve, it will be seen, may be ground without being removed from its seat.

Having thus described the invention, what is claimed as new, is:—

1. In a valve grinding machine, a rock shaft supported for oscillation, a wheel carried thereby, said wheel having a slot, a bearing sleeve extending through the slot, a wrist pin engaging the sleeve, a packing block of resilient material fitted in the slot and surrounding the bearing sleeve, a driven shaft having a wheel, a wrist pin upon the last mentioned wheel, and a pitman connecting said wrist pin with the wrist pin in the bearing member associated with the wheel carried by the rock shaft.

2. In a valve grinding machine, a base, a motor supported upon the base, a constantly driven shaft supported upon the base and having a wheel, a rock shaft supported upon the base and having a wheel, wrist pins associated with the wheels upon the constantly driven shaft and the rock shaft, a pitman associated with said wrist pins to transmit to the rock shaft from the constantly driven shaft an oscillatory motion extending through approximately three-fourths a revolution, a brace or clamping device including a driven shaft having a valve engaging head, and means for transmitting motion from the rock shaft to the shaft carrying the valve engaging head, said means including a telescoping extension shaft and universal joints.

3. In a valve grinding device, a brace or clamping member including telescoping extension members, means for securing said members in adjusted position, a bracket extending from one of the members and having a pivoted arm, brackets associated with the other extension member and affording bearings for two shafts geared together at substantially right angles to one another, one of said shafts carrying a valve engaging head, a universal coupling associated with the other shaft, a rock shaft, mechanical driving means for said rock shaft, and means for connecting said rock shaft with the shaft having the universal coupling, said means including an extension shaft and a second universal coupling.

In testimony whereof I affix my signature in presence of two witnesses.

HARRY F. WATERS.

Witnesses:

K. C. SCHUYLER,
A. S. GILL.