

Jan. 13, 1925.

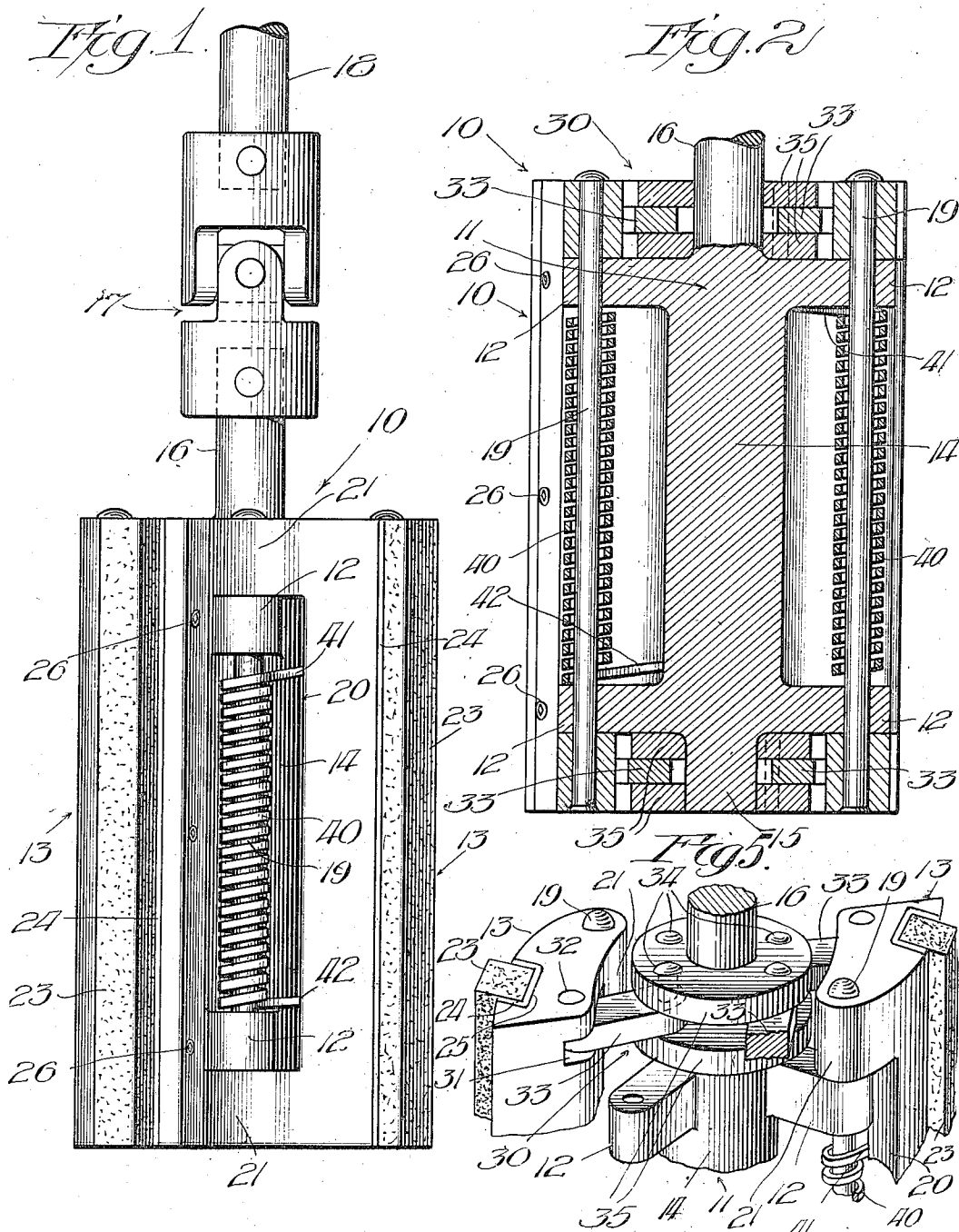
1,522,720

H. C. HEON

CYLINDER GRINDING TOOL

Filed Nov. 19, 1923

2 Sheets-Sheet 1



Witness:

Harry S. Gaither

Inventor:

Horace C. Heon

Rector Schenck Davis & McCauley

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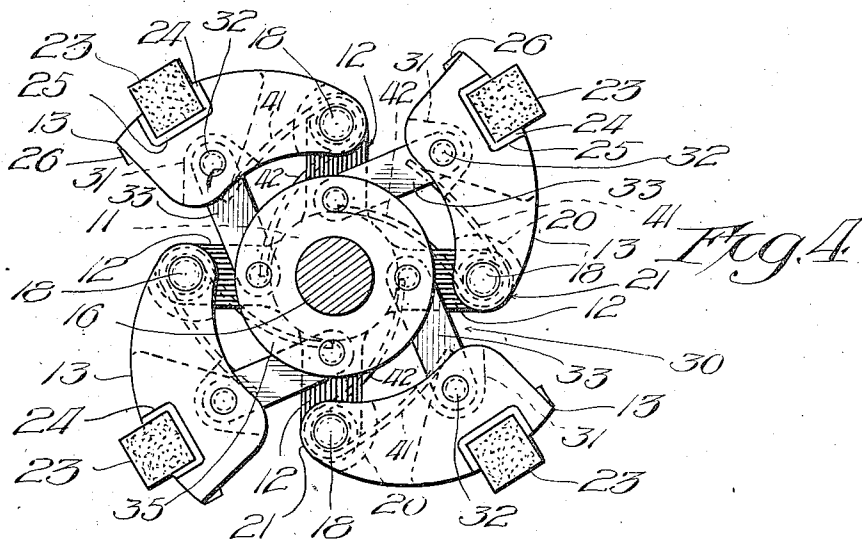
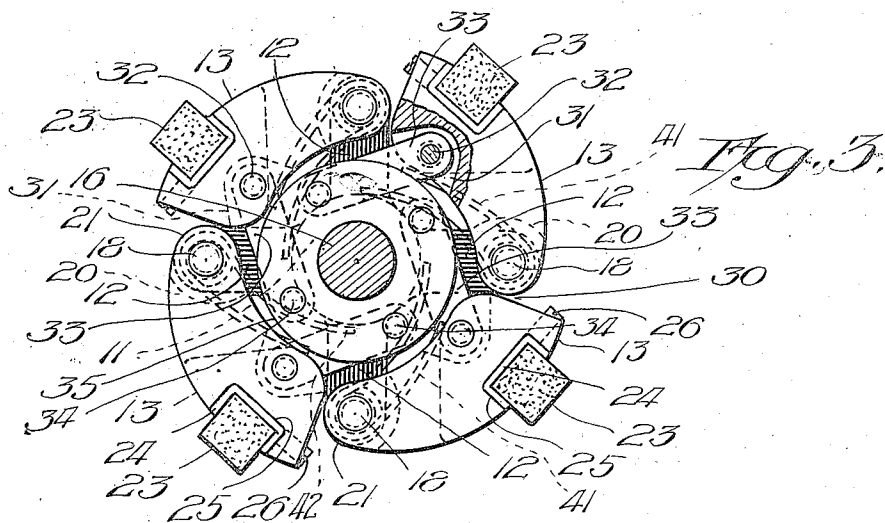
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Inventor:
Horace C. Heon
Witness:
Harry S. Gaither
By Preston Wilson Davis Attorney

Patented Jan. 13, 1925.

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UNITED STATES PATENT OFFICE.

HORACE C. HEON, OF CHICAGO, ILLINOIS, ASSIGNOR TO AUTOMOTIVE MAINTENANCE MACHINERY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

CYLINDER-GRINDING TOOL.

Application filed November 19, 1923: Serial No. 675,454.

To all whom it may concern:

Be it known that I, HORACE C. HEON, a subject of the King of Great Britain, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Cylinder-Grinding Tools, of which the following is a specification.

Among the general objects of my invention are to provide a tool of simplicity, ruggedness, efficiency and ease of operation, for the grinding of the cylinders of gas engines, pumps and the like, into truly cylindrical and highly polished condition.

My invention resides in the features of construction and arrangement of parts hereinafter set forth and claimed.

In the drawings, Figure 1 is a side elevation of a grinding tool embodying my invention; Fig. 2 is a vertical section there-through; and Figs. 3 and 4 are plan views showing the movable parts in different positions, and Fig. 5 is a fragmentary perspective.

In the drawings 10 indicates the tool comprising a carrier 11 of suitable longitudinal extent from which project the bearing members 12 with respect to which the gates or wings 13 are pivoted. The bearing members are shown as comprising four pairs of radial arms projecting from the axial body 14, said body being protracted beyond the bearing arms to afford shaft ends 15 and 16, the latter of which may be equipped with a universal joint 17 connecting it with a power-driven shaft 18. Each pair of bearing members 12, thus spaced apart near opposite ends of the carrier 11 receives a pivot-rod 18 by which the respective gates 13 will be positioned on the carrier.

Each gate 13 (shown as four in number, although I do not limit myself thereto) is a suitably shaped casting having its radially-inner edge 20 spaced apart somewhat from the pivot-rod 18, but at its ends is provided with lugs 21 that straddle over the two aligning arms 12, and receive the pivot pin 18. Thus each gate is pivotally mounted at its inner margin, and its outer portion is free for radial displacement relative to the carrier, as illustrated in Figs. 3 and 4. Each such gate carries a full-length abrading or polishing stone 23 protruding from its outer side face, the stone being supported in its gate in rigid

fashion, preferably with provision to minimize breakage by equalized and snug support. Thus the inner side of each stone is invested in a channeled holder 24, in which the stone is cemented or moulded, and this holder is seated in a pocket 25 in the carrier wherein it neatly fits and is secured against displacement by suitable set screws 26 contacting with the base portion of the holder and inserted through the end of the carrier.

To insure that under all conditions the gates will move in harmony, presenting the stones at equal radial distances from the axis of the carrier throughout the entire length of the stones, such gates are interconnected by an equalizing structure 30, preferably duplicated in the construction so that an equalizing system affects each end of all of the gates, it being understood that the structure at the bottom is identical in design with that shown at the top of the tool. Thus, each gate or wing is recessed as at 31 on its inner side near its free edge and in such recess there is pivoted, at 32 the outer end of a horizontal link 33, the inner end of which is pivoted as at 34 between two collars or common-connectors 35-35. These collars are mounted with respect to the carrier body 11 for relative freedom of rotation, thereby leaving the gates free for unison swinging displacement, but interconnected for mutual restraint. Each link preferably runs from its pivot point 32 to the connector collars in a direction away from the pivot rod of its gate, so that if any wing be impelled toward open position, its links pull the collars in clockwise direction (Fig. 3) and the linkage acts on the other wings pressing them out to an extent equaling the movement of the first-mentioned wing. The collars surround and are stabilized in position by the shaft ends 16 of the body, and it will be noted that the entire effective construction of the body and equalizers need be no longer than the abrading stone, so that if necessary the tool may be used to grind to a shoulder or to the closed end of a cylinder.

For exerting a pressure tending to force one or more of the gates outwardly toward its extreme position (in which position the corresponding links 33 will stand in position practically radial to the body 11) I provide one or more springs 40, of such

character and position that it may not materially change its tension during any movement to which the gates are subjected. Preferably I provide a spring 40 for each gate, making them approximately uniform in size and temper so that their tensions will be about equal, although on account of the provision of the equalizing mechanism connecting the gates, precise uniformity of spring-tension is not requisite. Each such spring I make in a long coil loosely surrounding a corresponding pivot rod 18, the opposite tails 41 and 42 of the coil being extended respectively to bear against the inner side face of the gate and against the body 11, so as to exert its pressure to force the gate outwardly. Such construction is inexpensive, and desirable in many ways, in protecting the spring, positioning it against possibility of displacement, giving it relatively great length for minimization of the effect upon spring-tension by any movement of the gate, etc.

It will be understood that the tool may be rotated by any suitable power device such as an electric motor, whether in a portable structure or a permanent machine, the assured accuracy with which the stones are always held in perfect parallelism and equidistant from the axis of the tool, as well as the available length of the stones and the adequacy of their protection against breakage in normal use, making the tool one particularly well qualified for use in a hand-manipulated grinder.

While I have herein described in some detail a particular construction for embodiment of my invention, it will be understood that changes in details of construction and

arrangement of parts may be made without departure from the spirit of my invention and within the scope of the appended claims; and it will further be understood that while I have particularly referred to "grinding" and to the use of abrasive "stones," the active elements which are carried by the wings may be surfacing or lapping elements of any suitable material.

I claim:

1. In a tool of the character described, a rotatable carrier, wings pivoted thereon for diameter-varying displacement, elongated pivot rods for said wings mounted in said carrier, and springs coiled about said pivot rods, and bearing at respectively opposite ends against the wing and the carrier.

2. In a tool of the character described, a rotatable body member having laterally extending arms, elongated pivot pins extending through said arms, stone-carrying wings pivoted on said rods and spaced therefrom throughout the center of length of the wings, and an elongated spring coiled around one of said pivot rods and bearing at opposite ends against the body and the underside of the wing, to tend to force said wing outwardly.

3. A structure as set forth in claim 2 combined with means, interconnecting said wings to equalize their pivotal movement.

4. A structure as set forth in claim 2, in combination with equalizing means connecting all of the wings and comprising links respectively connected to each wing at its outer end, and collars, rotatable about the vertical axis of the body and to which the inner ends of said links are pivoted.

HORACE C. HEON.