F. E. FULLER.

COMMUTATOR GRINDER.

APPLICATION FILED APR. 21, 1919.

1,352,805. Patented Sept. 14, 1920.

Fig. 1.

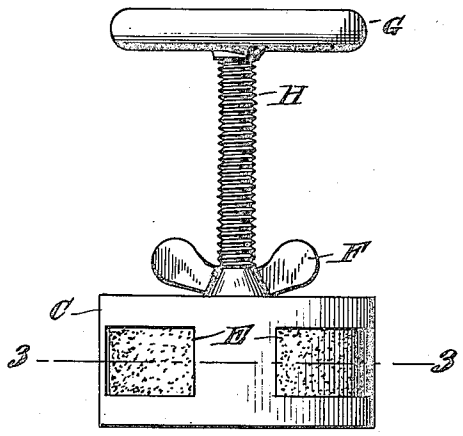


Fig. 2.

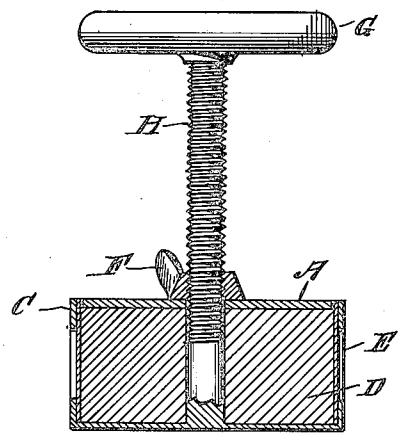


Fig. 3.

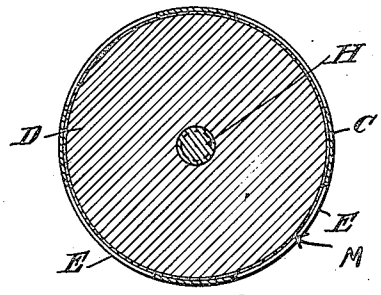


Fig. 4.

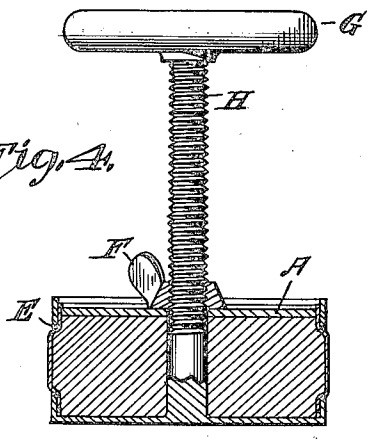
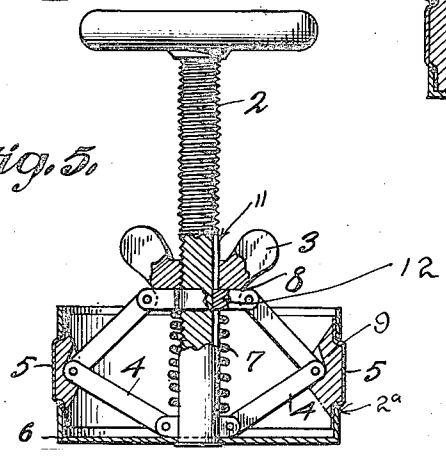


Fig. 5.



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UNITED STATES PATENT OFFICE.

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COMMUTATOR-GRINDER.

1,352,805. Specification of Letters Patent. Patented Sept. 14, 1920.

Application filed April 21, 1919. Serial No. 291,769.

To all whom it may concern:

Be it known that I, FRED E. FULLER, a citizen of the United States, and a resident of Portland, in the county of Multnomah and State of Oregon, have invented certain new and useful Improvements in Commutator-Grinders, of which the following is a specification.

My invention relates to improvements in grinding and polishing apparatus, it being more particularly a grinder or polisher for removing accumulations of dirt, and truing up the contacting surfaces of a commutator or timer for internal combustion engines, and it consists in the constructions, combinations, and arrangements herein described and claimed.

Another object of the invention is to provide a simple grinder for polishing the contacting surfaces of a commutator, which grinder is of such a nature that it can be readily applied and as easily removed.

Other objects and advantages will appear in the following specification, reference being had to the accompanying drawing, in which:—

Figure 1 is a side elevation of the improved grinder,

Fig. 2 is a longitudinal section showing the grinder in the normal position as when first applied,

Fig. 3 is a similar view showing the grinder in operative position as when the grinding surfaces are distended,

Fig. 4 is a horizontal section on the line 4—4 of Fig. 2, and

Fig. 5 is a section of a grinder showing a slight modification in the means for distending the grinding surfaces.

It is thought unnecessary to show or describe in detail the commutator or timer structure to which the grinder is to be applied. It is sufficient to say that the commutator comprises a round box of insulating material, with a plurality of contacts distributed on the inner peripheral surface. The timer arm travels around and completes a circuit with the various cylinders of the engine as the successive contacts are engaged.

These contacts eventually become covered by dirt, and they also sometimes require truing up. It is for the purpose of supplying the needs indicated by the presence of the two defective conditions, that the improved grinder is devised.

The grinder consists of a circular box or metal shell C with a plurality of preferably equidistantly spaced windows or openings E. The box is open at the top so as to enable the compression of the thick elastic washer D by means of the wing nut F, which bears on the metal follower A.

A strip of emery-cloth is applied to the peripheral surface of the elastic washer D, in front of the openings E, and as the wing nut F is screwed down on the fixed and rigid handle or stem H, the emery-cloth M is forced out of the openings E by reason of the compression of the washer D and the distention of portions thereof through the openings as clearly shown in Fig. 4. The stem H has a wheel or handle G at the top, by means of which the operator turns the grinder and thus polishes the inner surface of the commutator.

Before applying the grinder the parts are in the positions shown in Fig. 2, with the surface of the emery-cloth M well within the openings E. Of course when the wing nut F is screwed down, those portions of the emery-cloth adjacent to the openings E, are forced out until they stand in a plane beyond the peripheral surface of the shell C. These portions of the emery-cloth can be made to stand out as far as desired, the only requisite being screwing down harder on the wing nut.

It is important to observe that the strip of emery-cloth is easily removed and replaced when worn. It is an easy matter to take the follower A out far enough so as to obtain access to the strip and at the same time enable the insertion of a fresh one.

The modification in Fig. 5 shows a plurality of abrasion blocks 9, which coöperate with the openings 2^a of the shell 6, and are actuated by the toggle links 4. This arrangement takes the place of the elastic rubber washer D in Fig. 2. A facing of emery-cloth 5 is for the same purpose as the emery-cloth M in Fig. 2.

The casing 6 carries the stem 2, which is threaded, and has a key-slot 11 in which the key portion 12 of the upper toggle collar 8 rides and keeps the toggle mechanism from turning when the thumb screw 3 is turned to expand the abrasion blocks against the tension of the spring 7.

I claim:—

1. A grinder, comprising a body with openings, and abrasive means inside the

body, with associated means projecting the abrasive means out of the opening.

2. A grinder, comprising a body with openings, and abrasive means inside the body, with associated adjustable means for projecting the abrasive means out of the openings simultaneously to various distances.

3. A grinder, comprising a hollow windowed body with a fixed turning stem, abrasive means mounted on supporting structure behind the windows, and pressure apparatus adjustably operative on the stem to act on said structure and distend the abrasive means out of the windows to adjustable distances.

4. A grinder, comprising a shell with openings, an elastic substance filling the shell, with abrasive means behind the openings, and means operatively arranged for the exertion of pressure on the elastic substance to distend the abrasive means out of the openings.

5. A grinder, comprising a circular metallic shell, open at the top and provided with peripheral openings; an integral threaded stem with a turning handle, an elastic washer around the stem in the shell, abrasive means on the washer behind the openings, and means for compressing the washer, including a loose follower and a thumb screw on the threaded stem.

6. A commutator grinder, comprising a shell with openings, an integral threaded stem with a key-way and handle, an abrasive strip adjacent the openings, abrasion blocks for forcing portions of the strip out of the openings, and means for actuating said blocks, including toggle links with a head having a key riding in the key-way, a thumb screw on the threaded stem bearing on the toggle head, and a spring bearing beneath the toggle head.

In testimony whereof, I affix my signature.

FRED E. FULLER.