May 20, 1930. W. A. CHRYST 1,759,436

IGNITION APPARATUS

Original Filed July 15. 1922 2 Sheets-Sheet 1

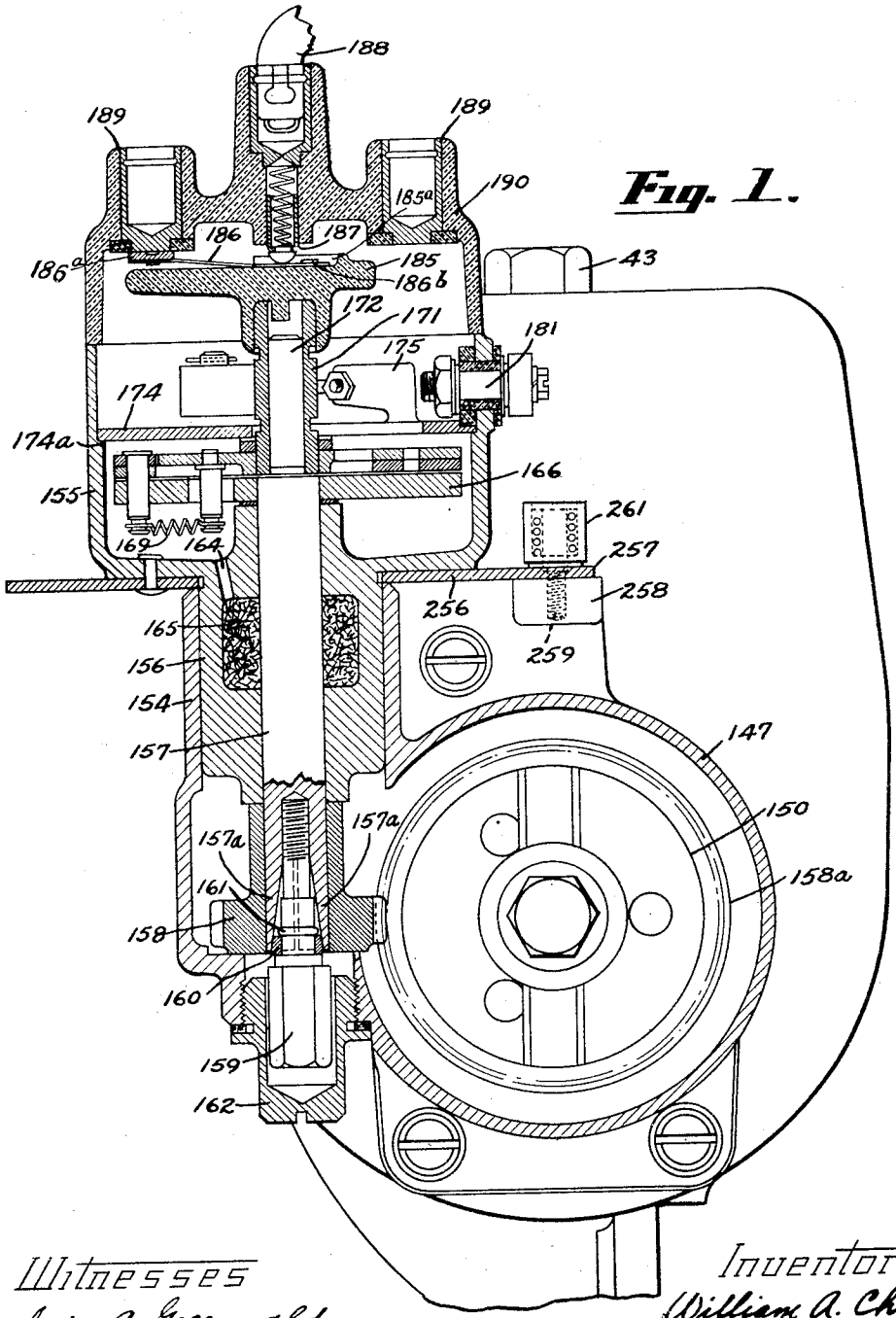


Fig. 1.

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IGNITION APPARATUS

Original Filed July 15. 1922 2 Sheets-Sheet 2

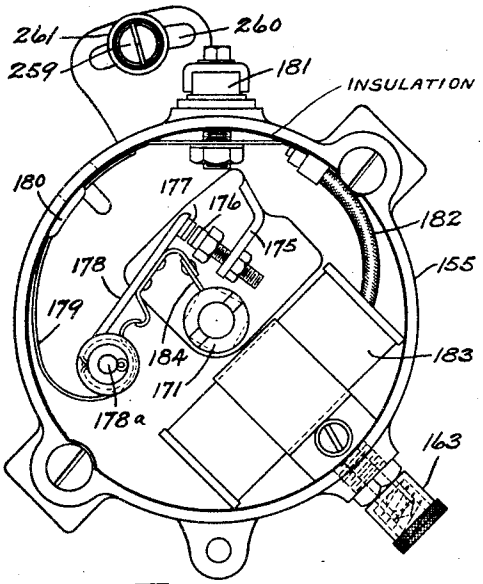


Fig. 2.

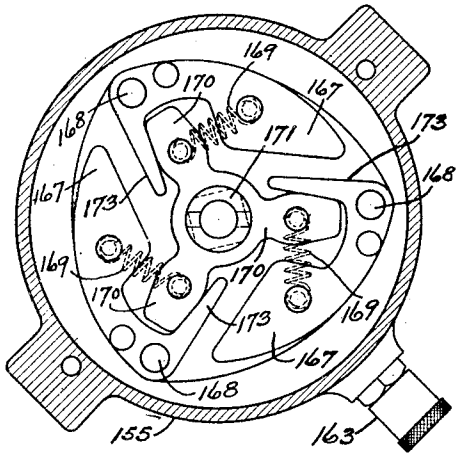


Fig. 3.

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Patented May 20, 1930

1,759,436

UNITED STATES PATENT OFFICE

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IGNITION APPARATUS

Original application filed July 15, 1922, Serial No. 575,217, Patent No. 1,606,207, dated November 9, 1926. Divided and this application filed March 1, 1926. Serial No. 91,629.

This invention relates to ignition apparatus for internal combustion engines and includes among its objects the simplification of the construction of the apparatus and provisions for the convenience and easy adjustment of the ignition timer cam with relation to the engine driven member which operates it.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings, wherein a preferred form of embodiment of the invention is clearly shown.

This application is a division of a copending application, Serial No. 575,217, filed July 15, 1922, now Patent No. 1,606,207, issued November 9, 1926.

In the drawings:

Fig. 1 is a longitudinal sectional view of an ignition timing and distributing apparatus, embodying the present invention.

Fig. 2 is a plan view of the apparatus with the distributor head removed.

Fig. 3 is a plan view of the automatic advance mechanism for the ignition timing apparatus.

Referring to the drawings, a generator frame 43 includes a gear case 147 which is formed with a hollow vertical boss 154 which supports the ignition timing and current distributing apparatus. 155 is a distributor cup having on its lower end a cylindrical bearing or shank 156 projecting into and rotatable in the hollow boss 154. A vertical distributor shaft 157 rotates in bearing 156 and carries on its lower end a worm 158 meshing with teeth 158ª formed on the outer peripheral surface of a rotatable element 150. Shaft 157 has a tapered bore in its lower end and is split longitudinally to form flexible end walls 157ª which are forced outwardly against the hub of gear 158. 159 is an adjusting screw, threaded into the shaft 157 and carrying an annular wedge 160 which is forced into the tapered opening in the lower end of the shaft 157 by turning the screw 159 to spread the flexible walls at the lower end of the shaft 157 and cause the latter to grip gear 158. Screw 159 is formed with an annular projection 161 which acts against the inner end of the wedge to release the latter from the shaft when the screw 159 is threaded out of the shaft. Screw cap 162 is threaded into an opening in the lower side of gear case 147 about the head of screw 159 to prevent lubricant, packed around the gears in the case, from leaking out.

The bearing 156 in which the shaft 157 turns, is lubricated by oil inserted in the cup through an oiler 163, the oil flowing through an opening 164 into felt packing 165 within the bearing 156 about the shaft 157.

256 is a manually operable control plate riveted to the lower side of the distributor cup and formed with an ear 257 resting on a boss 258 formed integrally with gear housing 147. 259 is a screw passing through an arcuate slot 260 in the plate and threaded into the boss 258. Spring pressed sleeve 261 carried by the screw 259 forces the plate against the boss to hold the distributor cup in adjusted position and to assist in holding the parts in assembled position on the gear housing 147.

Referring to Figs. 1 and 3, 166 is a weight driving plate fastened on the shaft 157 and carrying three weights 167 each pivotally mounted on a pin 168 carried by the plate 166. Each weight is connected by a tension spring 169 with an arm 170 secured to cam 171 rotatably mounted upon a reduced portion 172 of the shaft 157. During rotation of the shaft 157, portions 173 of the weights 167 engage the radial arms 170 attached to the cam and as the weights move outwardly against the tension of springs 169, the cam is automatically advanced.

174 is a breaker plate seating on a shoulder 174ª within the distributing cup above the automatic advance mechanism. This plate has an upturned portion 175 supporting a fixed contact 176. Movable contact 177 is supported by contact arm 178 pivotally and insulatingly mounted on a stud 178ª carried by plate 174. The contacts 176, 177 are normally held in engagement by leaf spring 179 engaging the movable contact arm 178 and a metal clip 180, the spring forming an elec-

trical conductor between the contact arm 178 and the clip 180. The clip 180 is connected to a binding post 181 and a cable 182 leading to a condenser 183. The clip 180 is insulated from the distributor cup 155. 184 is a camming block which rides on the cam 171 and causes separation of the contacts. Binding post 181 is adapted to be connected to a source of current such as a battery or generator which may be grounded. The circuit from the post 181 to ground includes clip 180, spring 179, contact arm 178, contacts 177 and 176, plate 174, cup 155 and housing 147 which is grounded. The condenser is connected in parallel with contacts 176 and 177 since one terminal of the condenser is connected by wire 182 with the clip 180, and the other terminal is provided by the case of the condenser which is grounded upon the plate 174.

185 is a non-conducting distributor rotor block mounted on the upper end of the cam 171 and having a leaf spring distributing arm 186 connected by spring pressed plunger 187 with a common high tension lead 188, the outer free end of the arm 186 having a contact button 186[a] engaging in succession a series of posts or stationary contacts 189 carried by a detachable distributor head 190. These posts are connected by cables 206 with the spark plugs of the engine. The distributing arm 186 is attached to the rotor block 185 by a single rivet 186[b], and is prevented from moving sidewise or rotating relative to the rotor block since it is confined by the parallel ridges provided by the block 185, one of these ridges being shown at 185[a].

To adjust the timing apparatus, the distributor head 190 and the screw cap 162 are removed, screw 159 is turned to release the wedge 160 and the distributor rotor is turned to rotate the shaft 157 within the gear 158 until the desired position of a cam lobe relative to the camming block is obtained. The screw 159 is then threaded into the shaft 157 to wedge the flexible end walls of the shaft against the gear 158, and the covers 190 and 162 are replaced. This permits an adjustment while the timing mechanism is assembled.

While the form of embodiment of the present invention as herein disclosed, constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claim which follows.

What is claimed is as follows:

Engine ignition apparatus comprising in combination, a timer cup, a terminal insulatingly supported by the cup, a condenser supported within the cup and electrically connected with a metal clip which is attached to the terminal, a cam within the cup, a breaker lever supported within the cup and operated by the cam, and a leaf spring conductor bearing at one end against the clip and electrically connected with the lever, said spring urging the lever toward the cam.

In testimony whereof I hereto affix my signature.

WILLIAM A. CHRYST.