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L. B. SAUER ET AL

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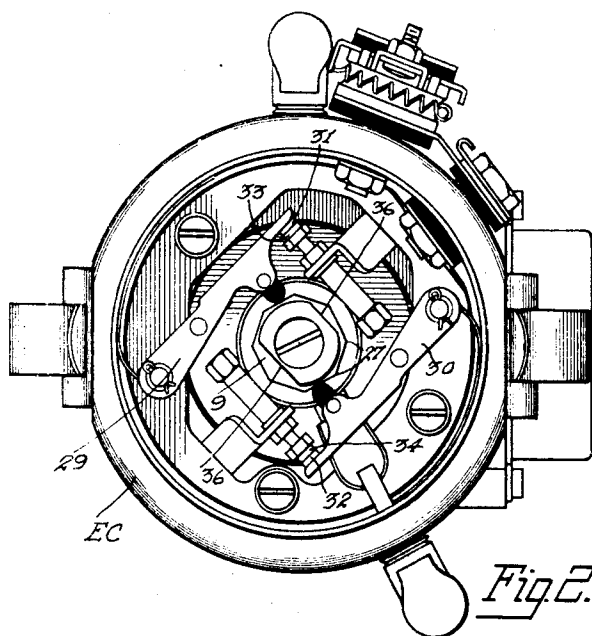


Fig. 2.

Fig. 3.

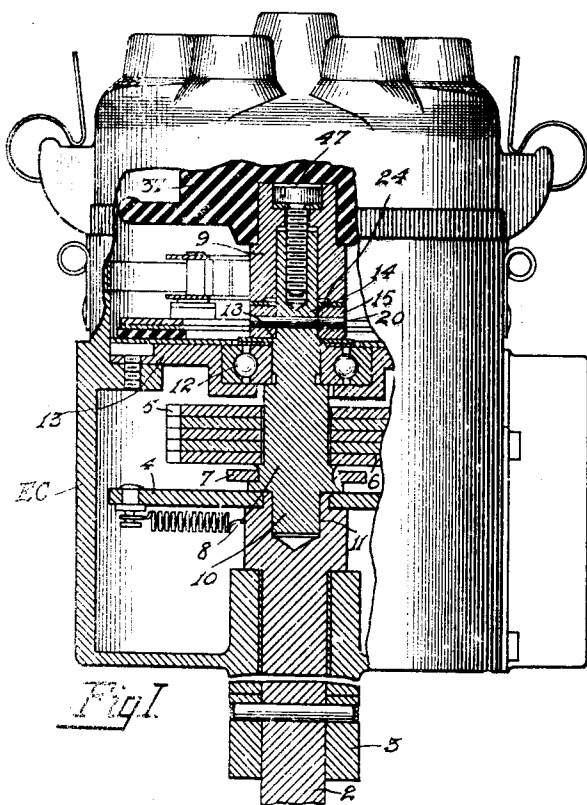
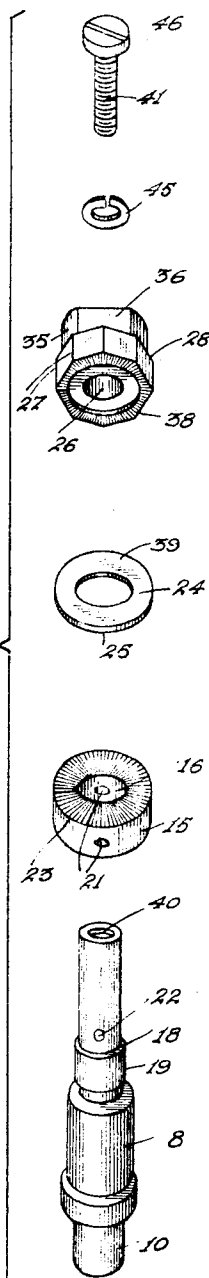


Fig. 1.

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UNITED STATES PATENT OFFICE.

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DISTRIBUTOR.

Application filed August 8, 1924. Serial No. 730,821.

Our invention relates to ignition timers or distributors and more particularly to that type of distributor which is combined with a combustion engine and which includes contact mechanism for properly timing and distributing the sparking impulses to the engine.

cam carrying element or stub shaft 8. The cam carrying element or stub shaft 8 together with the plate 4, weighted members 5 and 6, plate member 7 and certain other apparatus not disclosed in the drawing form an automatic control mechanism whereby the cam carrying element 8 is actuated relative to the engine driven shaft 2 in accordance with the varying speeds of the engine.

A feature of our invention is the provision of means for adjusting the cam portion of the timing mechanism of the distributor whereby the position of the adjusted parts including the cam may be easily locked and held in their adjusted position to secure a permanent adjustment of the contact controlling means or a cam.

Further features and advantages of our invention will be more fully described in the accompanying specification and for a better understanding of our invention reference may be had to the accompanying drawing in which a preferred form of our invention is illustrated and in which like reference characters in the several views denote like parts, and in which:

Fig. 1 is a side elevation of a distributor embodying our invention with some of the elements in section to more clearly illustrate the construction details of the same.

Fig. 2 is a plan view of Fig. 1 with the distributor head and rotor element removed to clearly illustrate the spark timing mechanism.

Fig. 3 is a disassembled perspective view of the elements which are included in the invention.

Referring now more in detail to our invention as illustrated in the accompanying drawing the device with which our invention is associated may be termed a timer or distributor which is adapted to control the time of occurrence of the distribution of the sparking impulses to the engine and is preferably driven by the engine. The distributor of our invention comprises a cup-shaped enclosing casing EC provided with an integrally formed hub or sleeve provided with a central orifice through which the shaft 2 extends. A member 3 pinned to the shaft 2 forms connecting means between the shaft 2 of the distributor and the engine shaft so as to transmit rotary motion thereto. A plate 4 is secured to the enlarged end of the shaft 2 and carries the pivoted weighted members 5 and 6 which in turn are operatively associated with a plate member 7 secured to a

The automatic control mechanism that we have referred to is clearly illustrated and described in an application of Louis B. Sauer, Serial No. 708,611, filed April 24, 1924, and for a clearer understanding of the automatic control mechanism with which our invention is associated reference may be had to the above mentioned application.

The stub shaft 8 which adjustably supports the cam 9 is provided with a reduced end portion 10 which rests in an orifice 11 in the shaft 2 and through connection means between the plate 4 secured to the shaft 2 the weighted members 5 and 6 on the plate 4 and the plate 7 secured to the stub shaft 8 motion from the shaft 2 which is driven by the engine is transmitted to the stub shaft 8. The stub shaft 8 extends through a suitable bearing 12 supported in a plate member 13 which is secured to the casing EC by suitable screws. The reduced end 14 of the stub shaft 8 protrudes up through the bearing 12 and adjustably supports the cam 9 and the means for adjustably supporting the cam 9 will now be described. A collar 15 provided with a central orifice 16 of a size to permit it being slipped over the end 14 of the stub shaft 8 rests against a shoulder 18 formed by an intermediate enlarged portion 19 of the shaft 18 and is pinned to the stub shaft 8 against movement by a pin 20 which passes through suitable orifices 21 in the collar 15 and orifice 22 in the shaft 8. The face 23 of the collar 15 is provided with a straight line nurl which nurling is radially disposed upon the face 23 with relation to the center of the shaft 8 for purposes as will presently be described.

A washer 24 of soft copper or other suitable material is next slipped over the end 14 of the shaft 8 its face 25 resting against the nurlled face 23 of the collar 15. The cam 9 is provided with a central orifice 26 of a size to permit its being slipped over the reduced end 14 of the shaft 8 and the plurality of lobes 27 formed on its circumferential face 28 actua-

ate the contact carrying arms 29 and 30 which carry contacts 31 and 32 to make and break the contact between their respective stationary contacts 33 and 34. The cam 9 is provided with a shank 35 which is provided with a flat portion on each side as at 36 to prevent movement of the distributor arm or rotor 37 which is carried by the cam 9. The bottom face 38 of the cam 9 is also nurlled in a manner similar to the nurling on the face 23 of the collar 15 and when the cam 9 is in position on the stub shaft 9 this nurlled face 38 engages the face 39 of the washer 24 which is interposed between the cam 9 and the collar 15.

It is often necessary to change the adjustment of the cam 9 and rotor 37 relative to the contact carrying arms 29 and 30 and their associated stationary contacts 33 and 34 and therefore means must be provided for maintaining the cam 9 in its adjusted position so as to secure the efficient operation of the timing and distributing mechanism and to this end we provide novel means for locking the cam 9 in its adjusted position.

The end 14 of the stub shaft 8 upon which the cam 9 is supported is provided with tapped orifice 40 which is adapted to receive a screw 41 which serves as the locking element. Now as the locking element or screw 41 is being screwed home, the cam 9 is forced down causing the nurlled face 38 of the cam 9 to engage the face 39 of the soft copper washer 24, and this downward pressure on the cam 9 caused by the screw 41 being screwed home also forces the washer 24 down causing its face 25 to engage the nurlled face 23 of the collar 15 pinned to the shaft 8. The continued downward pressure on the cam 9 and washer 24 caused by the locking member being screwed home causes the respective faces 23 and 38 of the collar 15 and cam 9 to bite or pierce the faces 25 and 39 of the soft copper washer 24. A split or lock washer 45 is placed under the head 46 of the screw 41 and when the screw 41 is screwed home the head 46 rests in a countersunk portion 47 in the shank 35 of the cam 9 the said lock washer 45 preventing the screw 41 working loose due to the vibration of the engine or car when running when the same is screwed home.

The collar 15 is pinned to the stub shaft 8 by the pin 20 and the pressure exerted by the screw 41 being screwed home causes the nurling on the face 23 of the collar 15 to bite or pierce the face 25 of the washer 24 and also causes the nurling of the bottom face 38 of the cam 9 to bite or pierce the face 39 of the washer 24 and with this arrangement it may be seen that as the collar 15 is fixed to the stub shaft 8, the washer 24 is held in fixed position against turning on the end of the stub shaft 8 due to the nurling of the face 23 of the collar 15 piercing or biting into the face 25 of the washer 24 and as the nurling on

the bottom face 38 of the cam 9 pierces or bites into the face 39 of the washer 24 the said cam 9 is securely locked in its adjusted position.

It will therefore be seen that the cam 9 is held or locked in a fixed adjusted position by means of the screw 41 and the nurling on the collar 15 and cam 9 in combination with the soft copper washer 24. The rotor 37 will be held in position as the rotor is carried directly by the cam 9.

To effect a further adjustment of the cam 9 and rotor 37 it is simply necessary to unscrew the locking bolt or screw 41 which will relieve the pressure on the cam 9 and permit the washer 24 to free itself from the nurlled faces 23 and 38 of the collar 15 and cam 9. The cam 9 can now be set manually to the desired position and when this is accomplished the screw 41 is again screwed home causing the nurlled faces 38 and 23 of the cam 9 and collar 15 to again bite into the respective faces 39 and 25 of the washer 24 to again lock the cam 9 in its adjusted position. The washer 24 can be freely rotated on the stub shaft 8 so that a new portion of the faces 23 and 38 will present itself to the nurlled faces 38 and 23 of the cam 9 and collar 15 and as the washer 24 is of soft copper a positive gripping surface is always available for the nurling on the respective faces 38 and 23.

While we have illustrated and described our invention in connection with a certain form of invention it is to be understood that it is applicable for other uses and it is also readily apparent that changes and modifications will readily suggest themselves, and we therefore aim to cover all such changes and modifications as come within the spirit and scope of the appended claims.

Having described our invention what we claim as new and desire to secure by Letters Patent is:

1. In a device of the character described, the combination with a driving shaft, a stub shaft operatively related to said driving shaft, a removable collar adapted to rest against an enlarged portion of said stub shaft and secured to said stub shaft by means of a pin adapted to extend thru said collar and shaft, a cam adapted to fit over said stub shaft, a washer interposed between said collar and said cam, said washer having plain faces, holding means on said collar and said cam, and a locking element for associating said means with said washer to maintain said cam in adjusted position.

2. In a device of the character described, the combination with a driving shaft, a stub shaft operatively related to said first shaft, a removable collar adapted to rest against an enlarged portion of said stub shaft and secured to said stub shaft by means of a pin adapted to extend thru said collar and shaft, a cam adapted to fit over the end of said stub

shaft, a washer having plain faces interposed between said collar and said cam, gripping means on said collar and said cam, and a locking bolt for associating said gripping means with said washer to maintain said cam in adjusted position.

3. In a device of the character described, the combination with a driving shaft, a stub shaft operatively related to said first shaft, a removable collar adapted to rest against an enlarged portion of said stub shaft and secured to said stub shaft by means of a pin adapted to extend thru said collar and shaft, said collar being provided with a nurlled face, a cam adapted to fit over the end of said stub shaft, a nurlled bottom face for said cam, a washer having plain faces interposed between said collar and said cam, and a locking element for associating said nurlled faces with said washer to maintain said cam in adjusted position.

4. In a device of the character described, the combination with a driving shaft, a stub shaft operatively related with said driving shaft, a removable collar adapted to rest against an enlarged portion of said stub shaft and pinned to said stub shaft by a pin adapted to extend thru said collar and shaft, a nurlled face on said collar, a cam adapted to fit over the end of said stub shaft, a nurlled face on said cam, a washer having plain faces interposed between said collar and said cam its said plain faces engaging the nurlled faces of said collar and said cam, and a locking bolt for forcing said nurlled faces into the faces of said washer to maintain said cam in adjusted position.

5. In a device of the character described, the combination with a driving shaft, a stub shaft operatively related with said driving shaft, a removable collar adapted to rest against an enlarged portion of said stub shaft and pinned to said stub shaft by a pin adapted to extend thru said collar and shaft, a nurlled face on said collar, a cam adapted to fit over the end of said stub shaft, a nurlled face on said cam, a washer having plain faces interposed between the nurlled faces of said collar and said cam, and a locking bolt for forcing the said cam and washer down to cause the nurling on the said faces to bite into the plain

faces of said washer to adjustably maintain the cam in adjusted position.

6. A device of the character described including a cam carrying element comprising a stub shaft, a removable collar having serrations adapted to rest against an enlarged portion of said shaft and secured to said shaft by means of a pin which extends thru said shaft and collar, a cam adapted to fit onto said cam carrying element, a member having flat faces between the serrations of said cam carrying element and said cam, and means for locking said cam in adjusted position.

7. A device of the character described including a cam carrying element comprising a stub shaft, a removable collar having a surface provided with serrations adapted to rest against an enlarged portion of said shaft and secured to said shaft by means of a pin which extends thru said shaft and collar, a cam adapted to fit onto said element and also having serrations, a flat member of soft material adapted to fit between the serrations of said cam and the serrations of said cam carrying element, and means for forcing said member into engagement with the serrations of said cam carrying element and said cam for holding said cam in adjusted position.

8. A device of the character described including a cam carrying element provided with an extended shoulder portion, a cam adapted to fit onto said cam carrying element and having the portion nearest the shoulder portion of said cam carrying element serrulated, a removable collar having a serrulated portion, said collar adapted to rest against said shoulder and being secured to said cam carrying element by means of a pin, and frictional means including a member having flat plain faces resting between the said cam and collar and means for forcing said cam and said member down whereby said serrulated portions of said cam and collar are caused to press into the faces of said member for holding said cam in adjusted position.

Signed by us at Chicago, in the county of Cook and State of Illinois, this 6th day of August, 1924.

LOUIS B. SAUER.
GEORGE A. YANOCHOWSKI.