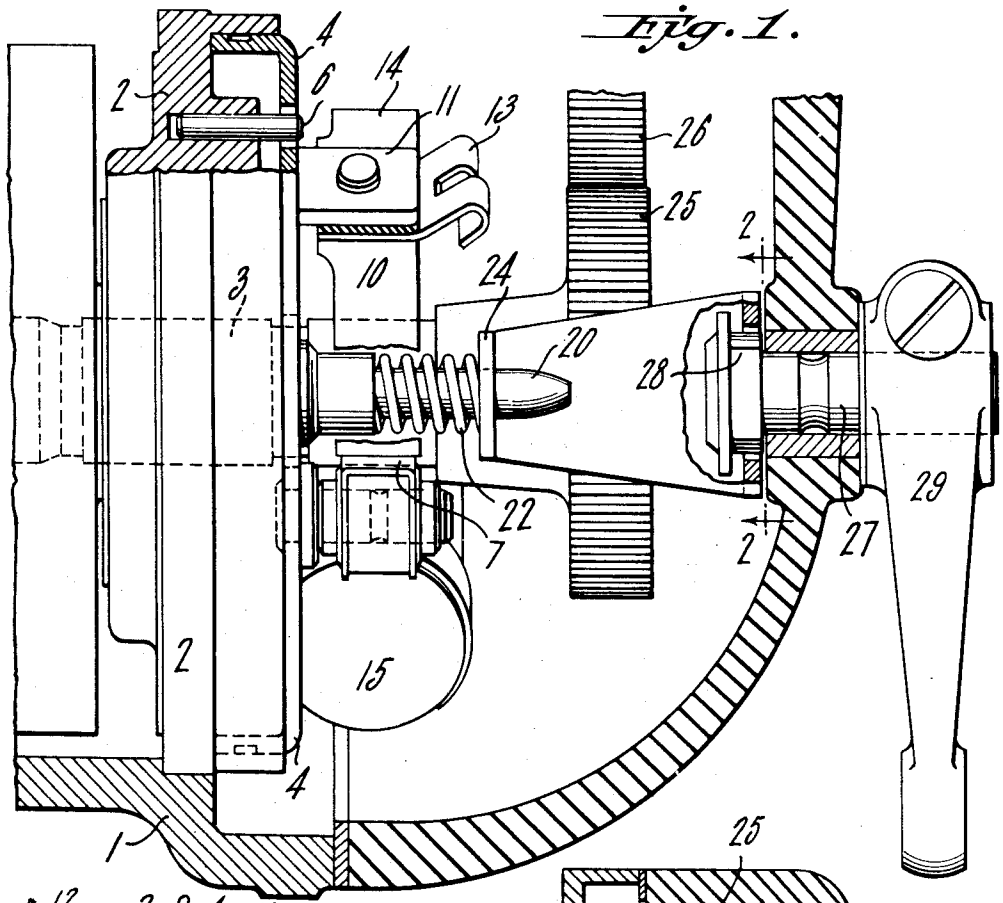
March 10, 1936. G. J. LANG ET AL 2,033,477

IGNITION TIMING MECHANISM

Filed May 2, 1935

Fig. 1.



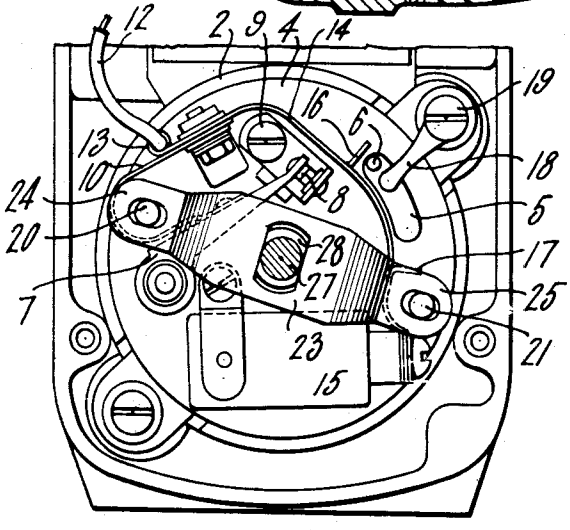


Fig. 2.

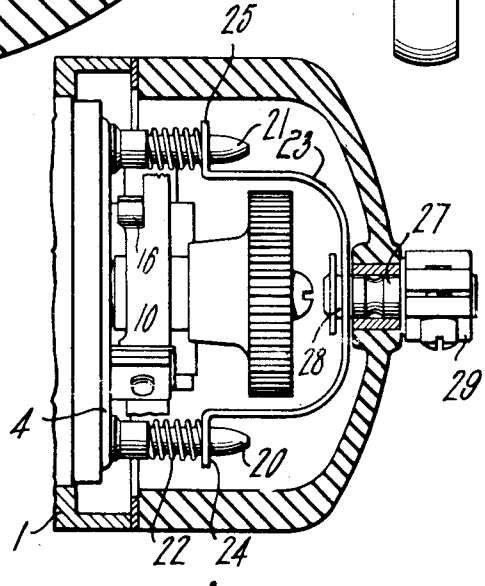


Fig. 3.

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IGNITION TIMING MECHANISM

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5 Claims. (Cl. 200—19)

This invention relates to ignition timing mechanism for internal combustion engines, and more particularly to variable timing equipment as applied to magnetos in such ignition systems.

An object of this invention is to provide a magneto with timing equipment which is more certain in operation and simpler in construction.

Another object is to provide a magneto with timing equipment which is more compact in structure and precise in operation.

Still another object is to provide a magneto with timing equipment which may readily be adapted to conform with either direction of magneto rotation.

A further object is to provide a magneto with timing equipment which will automatically maintain a short circuit of the primary winding of the magneto at full retard position and prevent any magneto output.

Other objects and advantages will in part be stated and in part be obvious when the following specification is read in connection with the drawing, in which:

Fig. 1 is a side elevation of the adjustable timing equipment shown partially broken away; Fig. 2 is an end view showing the breaker plate adjusting mechanism taken in section on line 2—2 of Fig. 1, the adjusting range limiting device and short circuiting arrangement; Fig. 3 is a top plan view showing the position of the breaker plate adjusting yoke.

Referring in more detail to Fig. 1, the numeral 1 represents the base of a magneto frame. A vertical bracket 2 is mounted in the frame and supports one end of the rotor shaft 3. Slidably mounted on the bracket 2 is a breaker plate 4 having an arcuate slot 5 which cooperates with a fixed pin 6 to establish a limit of angular travel for the breaker plate.

As best illustrated in Fig. 2, the breaker plate 4 carries an insulated breaker lever 7 which cooperates with a grounded stationary contact 8. By "grounded" is meant in electrical connection with the metallic frame of the magneto, or the breaker plate supporting bracket 2. The position of the stationary contact may be adjusted in a known manner by the adjusting screw 9 which secures the base of the stationary contact 8. The breaker spring 10 is insulatingly secured to a supporting post 11 and is electrically connected to the magneto primary or low tension lead 12 by a clamp terminal 13. Insulatingly supported on post 11 and connected to the breaker spring 10 is a condenser lead 14, the other end of which is connected with the condenser 15. Bent out from the condenser lead 14 are two short circuiting tabs 16 and 17 which are each positioned adjacent one end of the arcuate slot 5. Extending over the slot 5 and in the path of travel of tab 17 is a grounded contact arm 18 which is secured by a magneto frame bolt 19. As illustrated in Fig. 2, the breaker assembly is in full advance timing position, for clockwise rotation of the rotor shaft in its generally accepted meaning, with the pin 6 blocking any further clockwise movement of the breaker plate. In the art, the direction of rotor movement is determined with respect to the drive end of the magneto only, although as viewed in Fig. 2 the direction would actually be the reverse of the accepted terminology. When the timing is retarded the breaker plate is moved in a counterclockwise direction, and the ultimate retard position is determined by the lower end of the slot 5 striking the fixed pin 6. Slightly before full retard position is reached, the contact arm 18 engages the tab 17 and short circuits the breaker lever 7 and the associated magneto primary winding. To suit magnetos of opposite rotation, the arrangement provides that the pin 6 engages the lower end of slot 5 at full advance timing position, and the contact arm 18 is turned somewhat so as to engage tab 16 at full retard. Short circuiting the ignition at full retard position offers a convenient way of stopping an engine.

The breaker plate adjusting mechanism includes two studs 20 and 21 which are diametrically positioned at either side of the breaker plate 4 and which carry a coil spring 22, as shown in Fig. 1. A U-shaped yoke 23 is formed with outwardly extending pierced flanges 24 and 25 which fit over the studs 20 and 21. The openings in the flanges are elongated, having a width approximately equal to the diameter of the studs 20 and 21 and a length of considerably greater extent. By this means a loose driving connection is established which will permit a considerable lateral displacement of yoke 23 without binding. The arms of the yoke enclose the rotor pinion 25 which drives a distributor gear 26, shown in fragmentary form. A stub shaft 27 is journaled in the magneto end cap and has an enlarged head portion 28 having flattened sides and rounded upper and lower surfaces. An opening is provided in the loop of yoke 23 which receives the head 28 with a close fit along the flat portion and a loose fit at the upper and lower rounded surfaces. Due to the loose fit at these surfaces any angular variation between the centerline of the stub shaft 27 and the centerlines of the studs 20

and 21 may be compensated and an angular drive established. The direction of relative angular displacement of the yoke 23 and stub shaft 27 is determined by the planes of the flattened sides of the head 28. Thus the driving connection between the stub shaft and the breaker plate 4 has a universal joint action due to the elongated openings in the yoke feet 24 and 25 permitting a lateral action and the fit between the yoke 23 and shaft head 28 permitting a vertical action. The precise alignment of parts is dispensed with and still the breaker plate may be operated without any cramping or binding as would result from an off-center rigid drive. Attached to the stub shaft 27 is an operating lever 29 which may be adjusted to any suitable angular position and secured by a clamping device.

It will be obvious that many changes and modifications may be made by any one skilled in the art without departing from the spirit and scope of the invention as expressed in the following claims.

What is claimed is:

1. In ignition timing mechanism, an adjustable breaker plate, a plurality of projecting studs mounted on said plate, a yoke having spaced arms engaging said studs in a loose driving connection, a rotatably mounted stub shaft in loose driving connection with the central portion of said yoke, and an operating lever positioned on said stub shaft.

2. In ignition timing mechanism, an adjustable breaker plate, a yoke having spaced arms extending adjacent said plate, a loose drive connecting means between said spaced arms and said plate, a rotatable shaft, and means establishing a loose driving relation between said shaft and said yoke.

3. In ignition timing mechanism, an adjustable breaker plate, a yoke having spaced arms extending adjacent said plate, spaced studs mounted on said plate, driving means connecting said yoke arms and said studs and permitting relative motion in a single plane, a drive shaft, and connecting means between said shaft and said yoke, whereby relative motion is permitted in a plane different from said first named plane.

4. In ignition timing mechanism, an adjustable breaker plate, a yoke having spaced arms extending adjacent said plate, studs mounted on said plate and spaced to accord with said arms, connecting means permitting lateral motion between said studs and said arms, a drive shaft, and connecting means between said yoke and said shaft permitting a relative vertical motion.

5. In ignition timing mechanism, an adjustable breaker plate, a yoke having spaced arms extending adjacent said plate, studs mounted on said plate and spaced to accord with said arms, openings in said arms receiving said studs, said openings comprising slots having a width approximately equal to the diameter of said studs and a length substantially greater than said width, a drive shaft, a portion of said shaft having parallel flat surfaces formed thereon and rounded surfaces connecting said flat surfaces, an opening in said yoke receiving said shaft portion and conforming thereto in shape, said opening providing a close fit at said flat surfaces and a loose fit at said rounded surfaces.

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