AMERICAN BOSCH
PRODUCTS

REPAIR INSTRUCTIONS FOR AMERICAN BOSCH
Type U-4 Ed. 4 Magneto

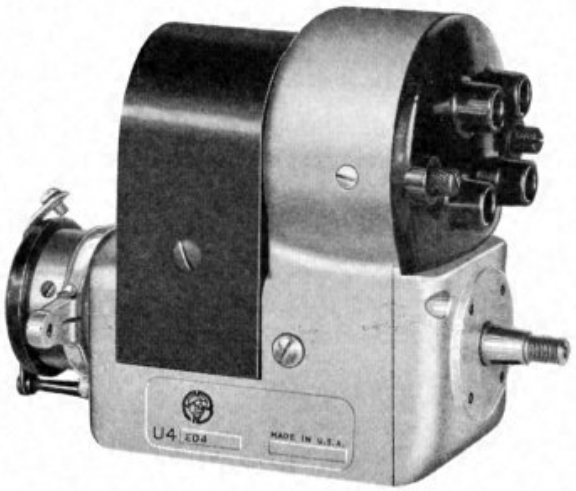

Fig. 1

Type U-4 Ed. 4 Magneto.

MECHANICAL DESIGN

The major difference in design between the Type U-4 Ed. 4 and the preceding U-4 Magnetos is the adoption of the single rotating distributor brush with stationary segment track instead of the stationary four brush system with single rotating segment. (See Fig. 2). The high tension current is collected from the collector ring by the brush (141) at the lower end of the distributor track and then carried to the center brush (83) which rests against the metal segment of the distributor rotor. The brush in the rotor distributes the current to each of the four distributor terminals through the metal segments in the distributor track. The track is fastened to the bakelite distributor plate by means of countersunk-head machine screws extending through the cable inserts into the segments of the track. Push type cable terminals are used instead of interior piercing screws.

One of the important features of the Edition 4 Magneto is that it is unnecessary to remove the distributor plate in order to locate the segment upon which the brush is resting. Protruding from the end of the distributor shaft is a pointed indicator, the point of which is in direct line with the distributor brush. By observing the pointer, it can be determined upon which segment the brush is then resting. This feature greatly facilitates the timing of the magneto to the engine. See page 3101i for timing instructions.

The construction of the armature is practically the same as that used on previous editions with the exception of the collector which is ¼" wider, providing further assurance against sparking and burning. A grease trap is placed between the collector

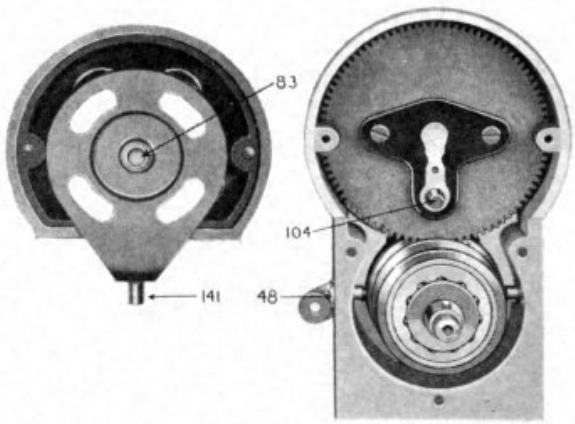

Fig. 2

Type U-4 Ed. 4 Magneto Showing Method of Spark Distribution.

Numbers shown in illustrations are for reference only. Order by part numbers shown in parts list on page 235.

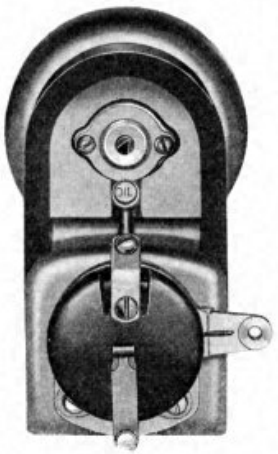

Fig. 3

Rear View of U-4 Ed. 4 Magneto Showing Oiler and Pointed Indicator.

ring and ball bearing to prevent ball bearing grease from spreading to the collector ring segment.

The interrupter is of the latest high speed design with an improved bearing pivot arrangement.

Careful and accurate machining, permitting a perfect fitting of assembled parts, together with the use of dust rings and gaskets, makes this magneto practically impregnable against dust, dirt and moisture.

CONSTRUCTION DETAILS

The simplicity of construction notable in the preceding U-4 Magnetos, is carried out even further in the Type U-4 Ed. 4. The magneto is shown completely disassembled in Fig. 4.

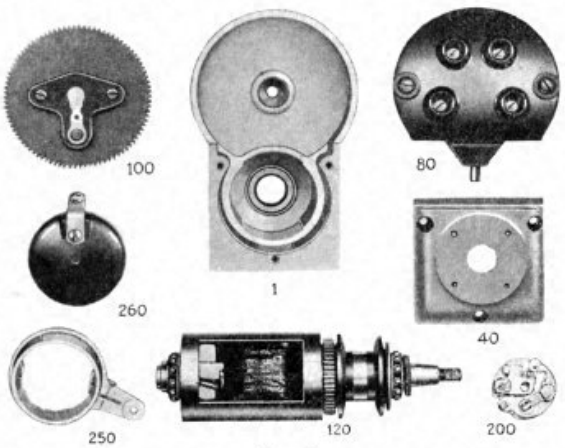

Fig. 4

Type U-4 Ed. 4 Magneto Completely Disassembled.

Numbers shown in illustrations are for reference only. Order by part numbers shown in parts list on page 235.

Magneto Frame

The main part of the magneto frame is an aluminum die casting with the pole shoes and bronze combination ball race holder and interrupter housing fit ring cast in. The magnet is fastened to the frame by means of two screws located on opposite sides. Removable lugs within the gear housing, provide the thread for the distributor plate fastening screws. The oiler provided for the distributor gear bearing, is located beneath the arch of the magnet. Two grounding brushes are provided, one located on each side of the magneto. The safety gap screw is located on the right hand side of the frame immediately in front of the grounding brush.

A concentric rolled bronze bearing is used since it has been possible to eliminate the eccentric adjustment of this bearing.

Complete Armature

The armature contains the main electricity producing parts—the laminated core, the windings and the condenser.

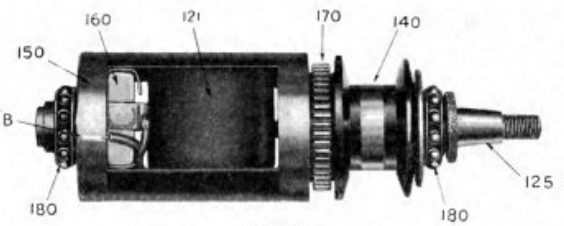

Fig. 5

Complete Armature of Type U-4 Ed. 4 Magneto.

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The wound core, or winding (121) is supported by the drive shaft (125) at one end and at the opposite end by the rear shaft assembly (150). The condenser (160) is partly housed in the armature rear shaft. The two primary leads of the winding are fastened to the clips on either side of the condenser and the grounding lead is soldered to the rear shaft at the position indicated by the letter "B." The armature gear (170) is mounted on the drive shaft.

Complete Interrupter

The interrupter, or circuit breaker (200 Fig. 6) is a mechanical device employed for opening and closing the primary circuit. It consists of a disc (202) upon which the stationary contact block (203) and the movable interrupter lever (210) are mounted.

Fig. 6

Interrupter and Interrupter Housing.

Numbers shown in illustrations are for reference only. Order by part numbers shown in parts list on page 235.

The adjustable or long contact screw is threaded into the contact block and the other one (short) to the interrupter lever. The lever is operated by a cam (251) affixed to the inner side wall of the interrupter housing (250). A keyed hub (F) on the interrupter disc fits into a keyway provided in the end of the armature rear shaft. The interrupter fastening screw secures the entire interrupter assembly to the armature rear shaft.

Miscellaneous Parts

The distributor gear is made of bakelite linen—a strong, durable material—which also contributes toward the smooth, quiet operation of the magneto. The rotor, mounted on the face of the distributor gear, is secured by means of two screws which are rivetted over on the back face of the gear to prevent the possibility of backing out.

The distributor plate and track assembly is secured to the gear housing by means of two serrated head screws. A washer with an expanding outer diameter and a contracting hole inserted in the distributor screw holes, holds the screws captive, thus preventing their loss if the plate is removed.

The shaft end plate, in addition to closing the armature tunnel, provides the lower seating face for the distributor plate and furnishes a seat for the front ball bearing. New Departure ball bearings, of 15 m/m diameter, are used both in front and rear. A substantial felt seal is placed in front of the bearing in the shaft end plate and a grease trap is provided between this bearing and the collector ring.

A new style bakelite end cap is used which conforms to the general appearance of the magneto. Instead of the conventional horizontal grounding terminal outlet, a stamped plate is used which is shaped so that it does not project horizontally beyond the end cap, thus effecting a saving of ½" in overall length.

DISASSEMBLING THE MAGNETO

1. Remove the two grounding brushes (48) located on either side of the magneto frame and the safety gap screw (46) on the right hand side of frame.
2. Swing the holding post spring aside and remove the end cap (260) and interrupter housing (250).
3. Withdraw the interrupter fastening screw (240) and remove the interrupter (200).
4. Loosen the distributor plate fastening screws and remove the plate (80).
5. Withdraw the three fastening screws and remove the shaft end plate (40).
6. Remove the lugs (16) located on either side of the gear housing.
7. Take hold of the armature (120) and distributor gear (100) and carefully pull both parts out together.

NOTE: Refer to Fig. 7 and parts list on page 235 for identification of parts.

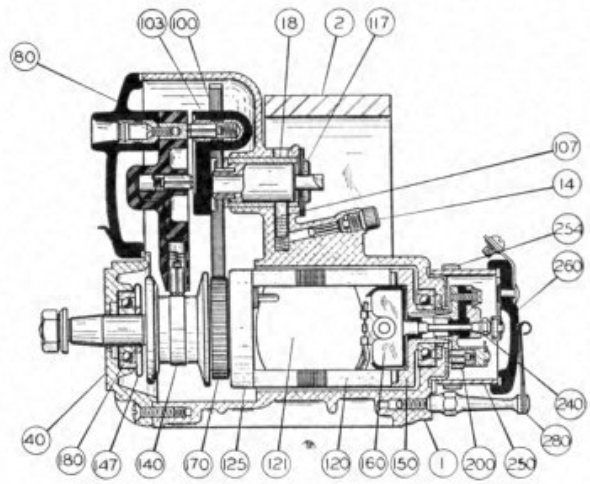

Fig. 7

Sectional View of U-4 Ed. 4 Magneto.

Numbers shown in illustrations are for reference only. Order by part numbers shown in parts list on page 235.

ASSEMBLING THE MAGNETO

1. Place the distributor gear in mesh with the armature gear in the position in which the parts are to be placed in the magneto. (Instructions for assembling the armature are given on page 3010o.)

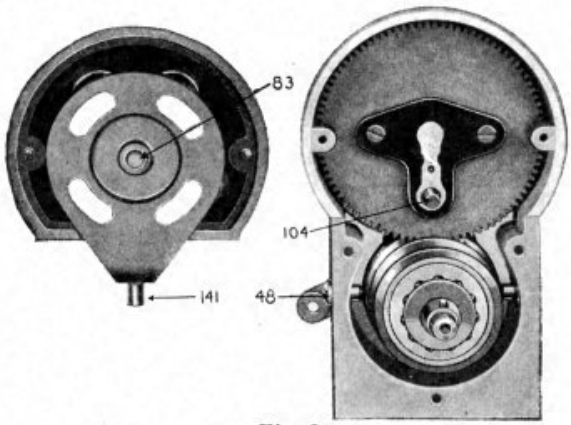

Fig. 8

Type U-4 Ed. 4 Magneto Showing Method of Spark Distribution

Numbers shown in illustrations are for reference only. Order by part numbers shown in parts list on page 235.

2. Refer to Fig. 8. Note the punch marks on the distributor gear with the letters "C" and "A" over them. For clockwise rotation, place the *beveled tooth* on the armature gear directly opposite the punch mark "C"; for anti-clockwise rotation, place the *beveled tooth* opposite the punch mark "A". (The direction in which the magneto is designed to run is indicated by an arrow on the lower corner of the shaft end plate. The rotation of the magneto is always determined from the driven end.)
3. With the gears meshed in the proper position, place the armature and distributor gear into the magneto frame. A felt oil wick extending thru the lower part of the distributor gear bearing, must be held down to allow the distributor gear shaft to pass thru the bearing. Remove the bearing dust cover (117) and hold the wick down with the screw driver until the gear and armature are in place, then replace the dust cover.
4. Assemble the shaft end plate and securely tighten the three fastening screws.
5. Place the interrupter in position, making sure that the key on the hub is properly seated in the keyway in the rear shaft, and secure it with the interrupter fastening screw.
6. Assemble the interrupter housing and end cap, and clamp the holding spring over the end cap.
7. Assemble the distributor plate and secure it with the two fastening screws.
8. Replace the two grounding brushes and the safety gap screws to complete the assembly.

Assembling the Armature: First place the insulations around the condenser in the following order: the insulating washer, the linen insulating strip and then the paper insulating strip.

See that the hard rubber bushing is in place in the center hole of the armature rear shaft. Press the condenser carefully into the rear shaft so that the insulations are not damaged and solder the grounding lead to the rear shaft.

After the condenser has been installed assemble the rear shaft to the wound core and fasten it with the four screws. Solder the two primary leads of the wound core to the lugs provided on each side of the condenser. Replace the armature drive shaft and secure it with four fastening screws. All the screws holding the rear shaft and drive shaft should be staked to avoid any possibility of their becoming loose.

Replace the armature gear and secure it with three fastening screws. Put the secondary wire from the wound core into the recess in the collector ring and press the collector on the shaft. Place the thin steel washer, the spring washer, the grease trap and the retaining washer in the order named, on the drive shaft in front of the collector ring and then assemble the inner ball races and ball cages to the front and rear armature shafts. Press the retaining collar on the armature rear shaft.

For instructions on Timing the Magneto, Care and Maintenance, Trouble Shooting and General Information refer to Service Manual pages 3101h, i, j and k.