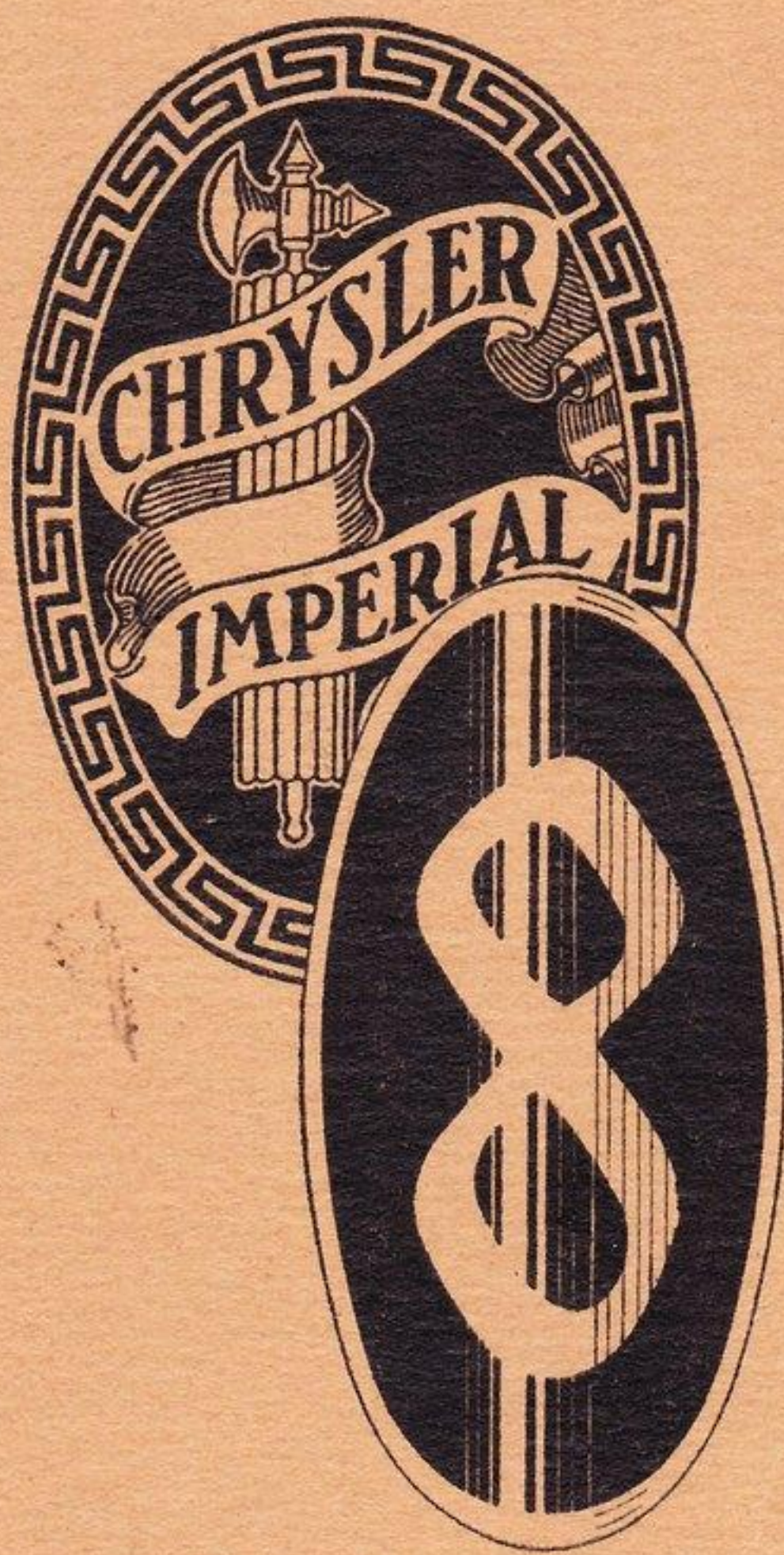




Instruction Book



Instruction Book

Second Edition
October 1930

Chrysler Sales Corporation

Division of Chrysler Corporation

Detroit, Michigan

U. S. A.

Price Twenty-five Cents

PRINTED IN U. S. A.

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Division of Chrysler Corporation

License Data

Chrysler Imperial Eight

Car Serial Number.....

Located on right front door hinge pillar post

Engine Serial Number..... (Stamped on boss left side of cylinder
block above water jacket cover between
numbers 1 and 2 cylinders.)

Cylinder Bore— $3\frac{1}{2}$ " (88.9 mm.)

Stroke—5" (127.0 mm.)

Number of Cylinders—8

N. A. C. C. Horsepower Rating—39.20

Piston Displacement—384.84 cu. in. (6308.85 cc.)

KEYS

Keys are serially numbered and number should be noted so that in case of loss new keys may be obtained. There is no number apparent on the lock cylinder. Not more than two keys may be ordered and shipment will be made only to Chrysler dealers. These rules are required by the Board of Insurance Underwriters for the protection of Chrysler owners.

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A Personal Message to Chrysler Owners

IT IS our sincere desire that you obtain from your Chrysler Imperial Eight the service, comfort, enjoyment, and innumerable miles of low-cost travel that we have earnestly endeavored to build into it.

It is necessary only that you treat the vehicle with reasonable care and consideration in order that you and your family or friends may realize these qualities.

In the pages that follow we give much valuable information, without going into intricate detail, that you should have in order to give your car the careful attention which it merits.

For extensive repairs or adjustments, we request that you take your car to a Chrysler Service Station, where it will receive the particular attention of an organization devoted to your interests, with mechanics specially trained in the maintenance of Chrysler Imperial cars, using genuine Chrysler service materials.

Communications with reference to Chrysler Imperial cars should give serial number and mileage.

CHRYSLER SALES CORPORATION

Division of Chrysler Corporation

Lock Your Car

The Chrysler Imperial Eight is equipped with a lock for the ignition. In addition to the ignition lock, cars with closed bodies are equipped with locks on all doors. The purpose of these locks is, obviously, to protect the owner of the car against theft.

Lock Your Car

Theft insurance on an automobile does not prevent theft. It is financial assistance to the car owner after the car is stolen. It does not cover the full value of the car from financial and service standpoints. The monetary loss is misfortune in an investment and the value of the service loss cannot be estimated.

Lock Your Car

Cars are generally stolen at a time when they are being used by the owner, either for business or pleasure. If stolen while being used for business, the loss of the car may mean the missing of very important business appointments.

Lock Your Car

The locks are provided as protection against theft. Perhaps a professional thief will steal a car regardless of the theft protection precautions which may be taken by the car owner or the car manufacturer, but, nevertheless, the petty thief, at least, will be stopped if the car is locked whenever it is not in use. Cars are stolen from garages as well as when they are parked by the roadside. It may be the car owner's intention to leave a car for only a few minutes, but that is generally just enough time for the thief who is watching his chance, to steal the car.

Lock Your Car

The ignition switch on the Chrysler Imperial Eight is operated by a key for stopping the engine, so that when the ignition is shut off it is a simple matter to lock the car by removal of the key. The door locks on closed cars are an added protection and should also be used.

Lock Your Car

Keys are serially numbered and numbers should be noted so that in case of loss new keys may be obtained. Only two keys may be ordered and shipment will only be made to Chrysler dealers. These rules are required by the Board of Insurance Underwriters for the protection of the owners of Chrysler Imperial Eight cars.

Lock Your Car

Chrysler Imperial Eight cars are provided with practical theft protection. This protection should be used.

Lock Your Car

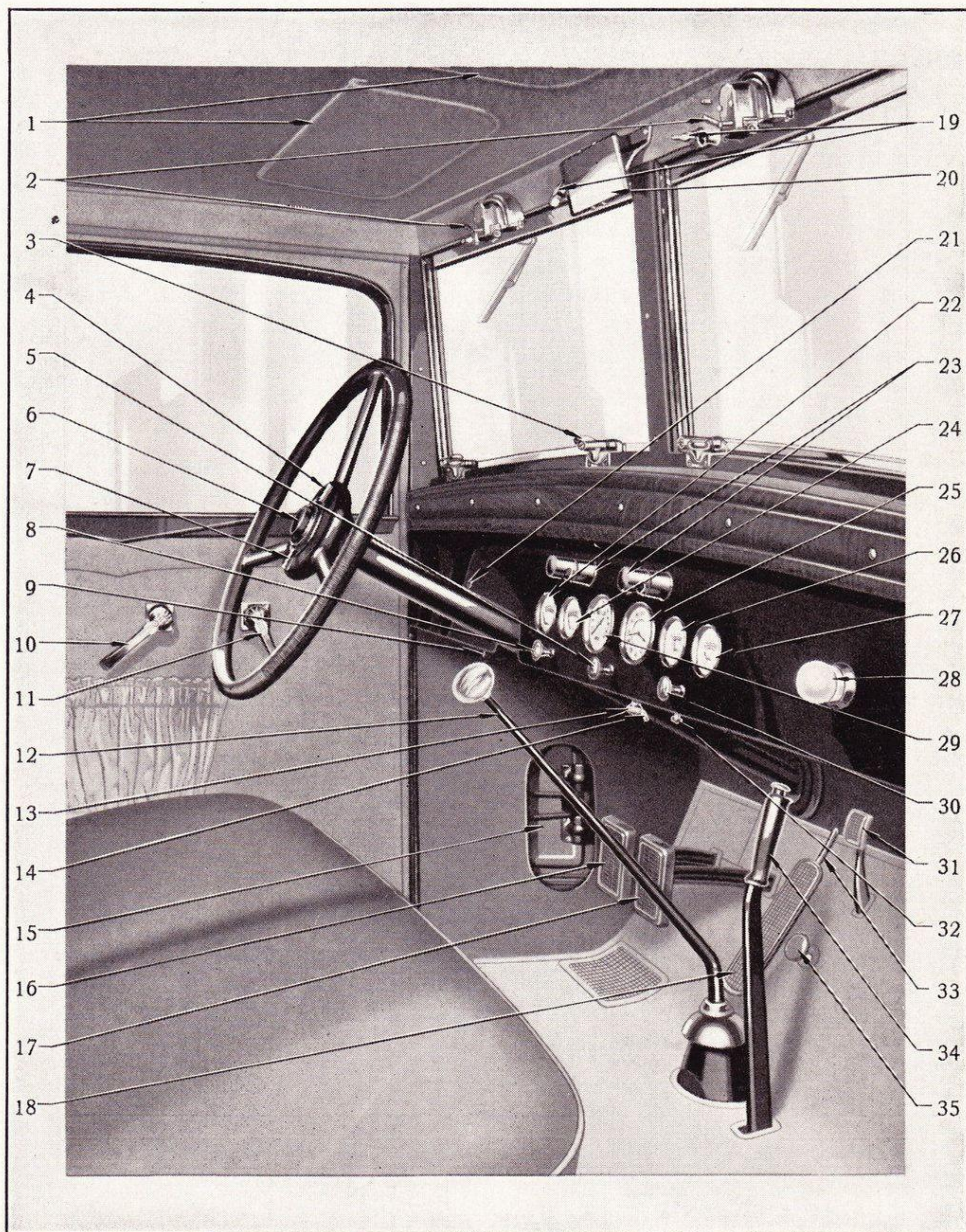


Fig. 1—Front Compartment

- 1—Sun visors
- 2—Windshield wiper controls
- 3—Windshield fasteners
- 4—Throttle control hand lever
- 5—Spark control button
- 6—Horn push button
- 7—Light control hand lever
- 8—Choke control button
- 9—Instrument lamp switch
- 10—Door remote control handle
- 11—Door window regulator handle
- 12—Gearshift lever

- 13—Clock wind and set stem
- 14—Speedometer trip set
- 15—Ventilator
- 16—Clutch pedal
- 17—Brake pedal
- 18—Accelerator pedal
- 19—Windshield regulator wing nuts
- 20—Rear view mirror
- 21—Ignition switch and lock
- 22—Thermometer
- 23—Instrument lamps
- 24—Oil pressure gauge

- 25—Clock
- 26—Ammeter
- 27—Fuel and oil level gauge (panel unit)
- 28—Cigar lighter
- 29—Speedometer
- 30—Manifold heat control button
- 31—Starter pedal
- 32—Oil level gauge switch
- 33—Accelerator pedal arm
- 34—Transmission brake hand lever
- 35—Accelerator pedal foot rest

OPERATION AND CARE

Regular inspection, with adjustment or tightening when needed, goes far toward keeping low the maintenance expense and upholding the high standards of quietness, reliability and performance built into the vehicle at the factory.

Preparation for Use

When a new car or a car which has been in storage for some time is being prepared for use the fuel tank, radiator, crankcase, and hydraulic brake reservoir should be filled with the proper liquids. All parts of the car should be lubricated as indicated on chart. (See Center Insert.) The air pressure in the tires should be checked to make certain that it is correct. (Page 72.) The specific gravity of the electrolyte in the storage battery should be tested to see that it is properly charged and at the proper level. (Page 47.)

To Start Engine

The ignition switch key should be turned on and the spark control button pushed "in" to the fully advanced position. Except when cranking by hand the spark button should be set full advance. The throttle lever (above the steering wheel) should be moved down just far enough to cause the accelerator pedal to go down approximately one-third the way. The clutch should be disengaged by pressing the left foot pedal down to the floor board. The starting motor pedal should then be pushed down (31, Fig. 1). If the engine is being started by use of the hand crank the spark button should be moved to the full retard position (pulled out as far as possible).

As soon as the engine starts to run under its own power, pressure should be released on starting pedal and clutch pedal. The throttle should be closed immediately and the spark button fully advanced if engine has been cranked by hand. (The throttle lever on top of the steering wheel.)

During cold or cool weather the manifold heat control may be used when starting a cold engine. Instructions for operating this device are on Page 65 and should be consulted.

CAUTION: The garage doors should always be opened before starting the engine. The exhaust gases from a gasoline engine contain carbon monoxide, which is a deadly poison.

If the starting motor cranks the engine 15 to 30 seconds without the engine starting under its own power, the starting pedal should be released and the cause of the engine not starting determined. (Page 75.) Prolonged use of the starting motor will soon discharge the storage battery. The starter should be released the moment the engine starts.

When starting the engine, the choke may be left on until the engine starts, as the automatic flapper valve (23, Fig. 23) opens and permits sufficient air to enter so that the engine will continue to run. However, as soon as the engine is started, the choke should be pushed "in" to the best running position.

To insure a quick and easy start, a hookup between the carburetor and the starting motor pedal opens the throttle whenever the starter pedal is depressed and insures a quick start in extremely cold weather.

Driving the Car

The hand brake lever should be in the released position (forward as far as possible) and the clutch disengaged (pedal pressed down to the floor). Then the transmission gears should be shifted to the starting range position by tilting the gear-shifting lever to the left and rearward (or reverse position by tilting the gear-shifting lever to the left and forward, as is required) and the speed of the engine increased slightly by pressure on the accelerator pedal. Simultaneously with the increase of the engine speed, the clutch should be gradually engaged. If the car is being moved forward and when it has attained momentum, the clutch should be disengaged, the accelerator released, and the gears shifted to the accelerating range position by moving the gear-shifting lever forward to neutral and tilting to the right, then forward again. As soon as the accelerating range gears are engaged, the clutch should be engaged again and the accelerator pressed until the car reaches further momentum. Then the transmission gears should be shifted to the speed range position by moving the gear-shifting lever straight back past the neutral position and operating the clutch and accelerator pedals as before.

The gears should never be shifted while the clutch is engaged. The reverse gears should never be engaged while the car is moving forward nor the forward range gears engaged while the car is moving backward.

Stopping the Car

If it is necessary to shift the gears from a higher to a lower range while the car is moving, the clutch should be disengaged, the desired gears meshed, and the engine speed increased before engaging the clutch. This shift when necessary, due to conditions of traffic or load, should be done quickly so as to retain as much as possible of the momentum of the car. If the driver wishes to drive at a constant speed for any length of time, the throttle may be controlled by the hand lever at the top of the steering wheel and the foot removed from the accelerator pedal.

When it is desired to stop the car, the throttle should be closed and the clutch disengaged. Movement of the car may be stopped by use of the foot brake. When the car has stopped, the gears should be shifted to the neutral position (central position of gear-shifting lever) and the hand brake applied. The clutch may then be engaged and the engine stopped, if desired, by removing the ignition switch key. (21, Fig. 1.)

Your brakes are vital to your safety. Chrysler Imperial Eight brakes are extremely efficient. When adjustment or service is necessary have this done only in a **Chrysler Service Station** by Chrysler methods and with genuine Chrysler materials.

BE SURE OF YOUR SAFETY

Caution

Chrysler Imperial Eight cars are equipped with Chrysler four-wheel hydraulic brakes and if sharply applied will bring the car to a stop almost instantly. For this reason, except in case of emergency, the brakes should be applied gently.

Washing the Car

It is possible in many instances to clean the lacquer finish of the body and hood by wiping with a dry cloth, but it is usually best to wash the finish with water and a sponge, especially if there is grit in the mud or dirt. At times the finish may appear to be turning gray or white, which only indicates that cleaning and polishing are required. If alcohol is spilled on the finish it should be wiped off immediately to avoid spotting.

Varnish should not be used for touching up scratches in the lacquer finish. Lacquer only should be used for such purposes.

The undersides of the fenders and the running gear should be flooded with water and, after most of the mud is soaked off, a warm soapsuds will take off the remainder. Then it should be thoroughly rinsed with running water. The same sponge should not be used on the body and running gear. After washing, the car should be thoroughly dried with a soft chamois skin.

After the car is clean, it should be polished with a good polish made especially for lacquer finishes.

The finish should be protected by an application of Wax. This is an important factor in the life of the finish.

Precautions for Summer

The cooling system should be thoroughly flushed and all water leaks stopped (new hose installed, if necessary). Fresh lubricant should be used in the transmission and rear axle after the interiors of these cases have been thoroughly cleaned by flushing with kerosene, and oil leaks stopped. The carburetor choke should be adjusted, if necessary, for full opening. The battery terminals should be cleaned and coated with vaseline and water replenished in each cell when necessary. It is possible that the generator charging rate will need to be reduced to prevent excessive evaporation of the battery water. The car should have a general inspection and lubrication throughout, including the grinding of valves and relining of brakes, if necessary. The engine oil should be changed every 1000 miles (1600 km.) during normal operation in warm weather, but when the car is driven extremely fast or worked hard on heavy pulling in hot weather the oil should be changed every 500 miles (800 km.).

Precautions for Winter

A non-freezing solution should be used in the cooling system after the first indication of cold weather. (Page 35.) If an alcohol solution is used, the specific gravity should be checked about once a week to make sure of it being the desired strength, because alcohol evaporates rapidly and raises the freezing point of the solution.

The carburetor should be drained to remove any water which may have collected there.

The engine oil pan should be removed and thoroughly cleaned, as well as the oil strainer, the parts then reinstalled and the pan filled with fresh oil. When refilling at temperatures approaching zero, an oil having a zero or below zero cold or pour test should be used which has a body or viscosity meeting S. A. E. viscosity number 10 or 20. The engine oil should be changed every 500 miles (800 km.) during normal operation in cold weather, but if the car stands in the cold and is used principally for short runs the oil should be changed every 250 miles (400 km.).

The lubricant in the transmission and rear axle should be drained and the cases should be filled to the proper level with the lubricant specified on Lubrication Chart.

Tire chains should be adjusted loosely enough to allow them to creep around the tires.

Storage of Tires

If the car is not to be used for several months it should be jacked up until the tires clear the floor. The tires should be inflated only sufficiently to hold their normal shape. If convenient it is well for the tires to be removed from the rims and placed in a room with subdued light and a temperature of about 60 degrees Fahrenheit (15.5° Centigrade). Tires in storage or not being used frequently should be protected from strong sunlight.

Storing the Car

The car should be thoroughly washed and dried, also the curtains and top brushed before being stored. The wheels should be jacked up sufficiently for the tires to clear the floor. Unpainted metal parts should be coated with heavy oil to prevent rust and corrosion. The storage place should be dry and have as even a temperature as possible. Sudden changes of temperature and close proximity of steam pipes or other heating apparatus should be avoided. A subdued light evenly distributed will best preserve the finish. A car should never be stored in the same building with horses or other animals. The water should be drained from the radiator. The spark plugs should be removed and cleaned and a small quantity of engine oil poured into each cylinder through the spark plug holes. Then the spark plugs should be reinstalled and the engine cranked several times by hand. This operation should be repeated every sixty days while the car is in storage.

Partly disengaging the clutch and blocking the pedal in this position will prevent corrosion developing on the faces of the clutch plate. The hand brake should be released and the storage battery stored at a battery service station for proper attention during the storage period. (Page 47.)

ADJUSTMENTS AND REPAIR OPERATIONS

FRONT AXLE

The front axle center is a heavy "I" section steel forging, with spring saddles and yokes forged integrally; the steering arms and steering knuckles are heavy drop forgings.

It is of vital importance in the safe operation of a motor car that the front axle tie rod and wheels be kept well lubricated and properly adjusted. They should be lubricated regularly as designated on Lubrication Chart.

Front Wheel Alignment and Tie Rod Adjustment

Correct alignment of front wheels must be maintained to assure continuous, easy steering and long tire mileage. The wheel bearings should be properly adjusted and tire pressures equal before taking measurements. The distance between the wheels when measured in front at the felloe, approximately 9 inches (228.6 mm.) above the floor, and in rear from the same points should be equal to or not greater at the rear than $\frac{1}{8}$ inch (3.18 mm.). Wheel alignment should be checked with an accurate gauge designed for this purpose, with the car on a level floor.

To change or adjust wheel alignment, loosen the clamp bolts which lock the end forgings to the cross tube. Adjust length of cross tie rod by revolving the cross tube similar to adjusting a turnbuckle, then securely lock clamp bolts.

The lubricant nipples in the tie rod ends face toward the rear of the car and should receive fluid gear lubricant from the high-pressure lubricant gun every 500 miles (800 km.).

The king pins should be lubricated every 500 miles (800 km.) with fluid gear lubricant by means of the high-pressure lubricant gun and the nipples provided in the side of the axle yokes toward the front of the car.

Drag Link

The drag link (Fig. 3) connects the steering gear with the front axle. In each end of the drag link tube is a heavy spring for cushioning the road shocks of the front wheels which otherwise would be transmitted to the steering gear. The springs are adjusted by means of round slotted plugs threaded into each end of the drag link tube. Cotter pins are inserted through the ends of the tube, and slots in the outer ends of the round plugs, to prevent the plugs changing their adjustment.

When adjustment is being made of the drag link bearings and springs, all of the parts should be cleaned and oiled as well as the adjusting plugs and threads inside of the drag link tube. Standard springs should be used to replace any that do not measure $1\frac{1}{16}$ " (27.0 mm.) free length. Any other worn parts should be replaced. When the parts are being assembled the adjusting plugs should be screwed "in" until the springs are compressed solid, then the plugs should be unscrewed one-fourth of a turn. A large screwdriver should be used for adjusting the plugs so as to overcome any binding in the threads. When the plugs are adjusted properly the

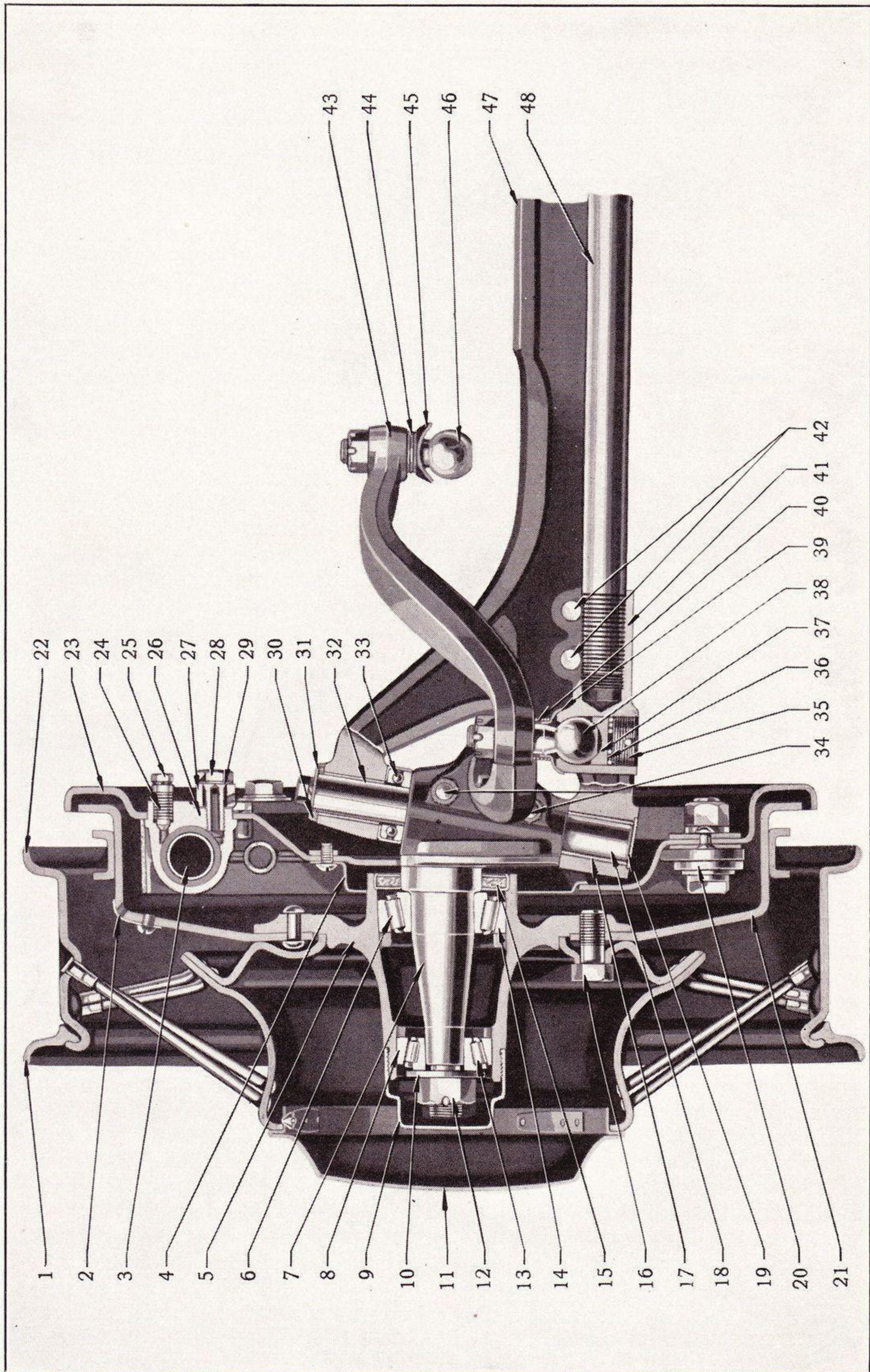


Fig. 2—Front Axle

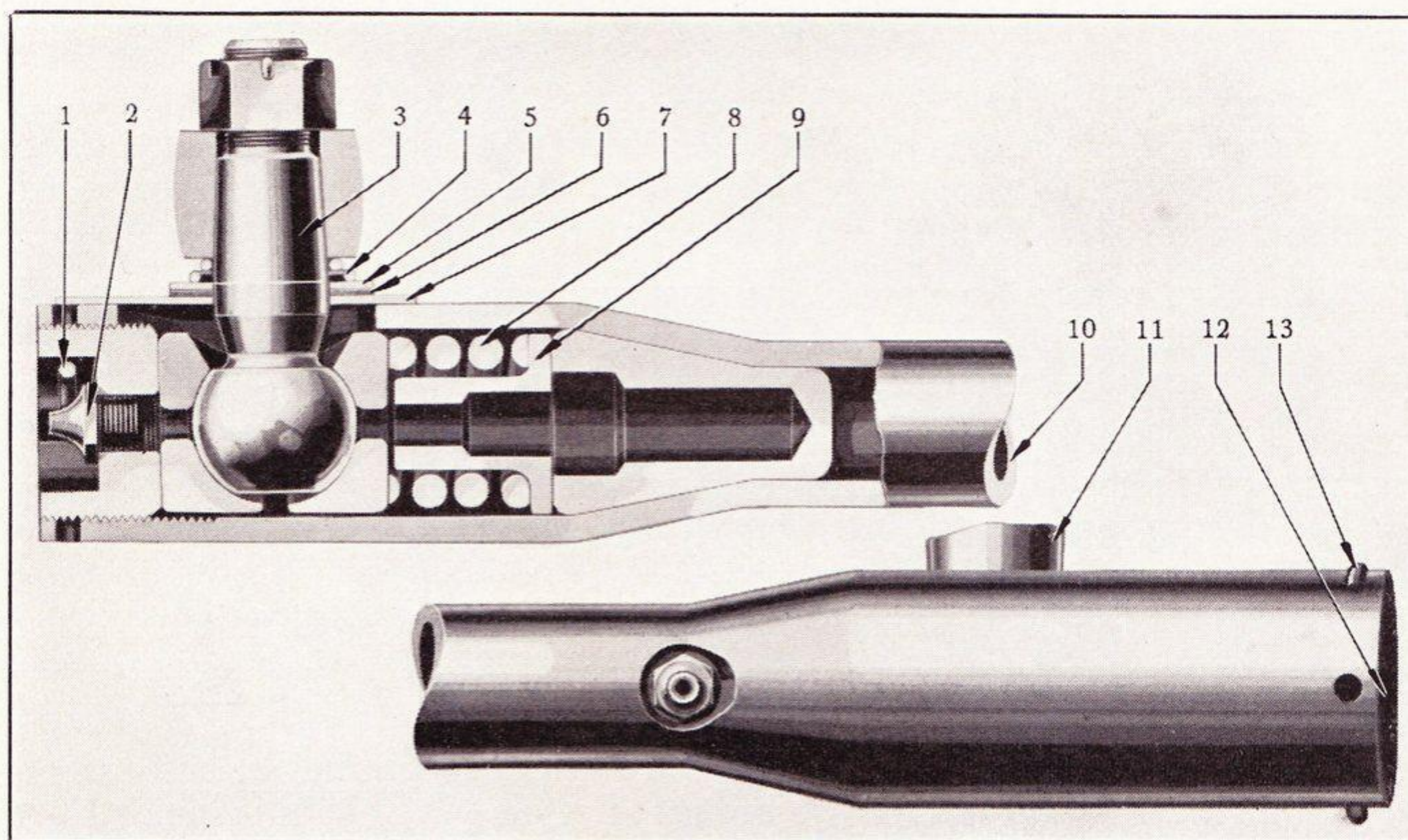


Fig. 3—Drag Link

- | | |
|---|---|
| 1—Drag link spring adjusting plug lock wire | 8—Drag link spring |
| 2—Drag link lubricant nipple—front | 9—Drag link spring seat |
| 3—Drag link ball | 10—Drag link body or tube |
| 4—Drag link ball dust cover spring | 11—Steering gear arm |
| 5—Drag link ball dust cover washer | 12—Drag link spring adjusting plug—rear |
| 6—Drag link ball dust cover leather washer | 13—Drag link spring adjusting plug cotter pin |
| 7—Drag link ball dust cover | |

position of their outside faces should be flush with the ends of the tube or slightly “in”, *but must not protrude*.

The steering arm balls of the front axle and the steering gear arm in the drag link ends should be lubricated with fluid gear lubricant through the grease nipples at intervals of every 500 miles (800 km.).

Fig. 2—Front Axle

- | | |
|---|---|
| 1—Wheel rim side ring | 28—Wheel brake cylinder inlet connection bolt |
| 2—Wheel brake drum inspection hole cover | 29—Wheel brake cylinder inlet connection bolt gasket |
| 3—Front wheel brake cylinder | 30—Front axle steering knuckle pivot dust washer |
| 4—Front wheel brake support dust shield | 31—Front axle steering knuckle pivot dust washer cover |
| 5—Front wheel hub | 32—Front axle bushing—upper |
| 6—Front wheel inner bearing cone and rollers | 33—Front axle steering knuckle thrust bearing |
| 7—Front axle steering knuckle—left | 34—Front axle steering knuckle pivot lock pins |
| 8—Front wheel outer bearing cup | 35—Front axle steering knuckle tie rod plug |
| 9—Front wheel hub grease cap | 36—Front axle steering knuckle tie rod bearing spring |
| 10—Front wheel bearing lockwasher | 37—Front axle steering knuckle tie rod end ball seat |
| 11—Wheel hub shell cap | 38—Front axle steering knuckle tie rod ball |
| 12—Front wheel bearing nut | 39—Front axle steering knuckle tie rod ball dust cover |
| 13—Front wheel outer bearing cone and rollers | 40—Front axle steering knuckle tie rod ball dust cover spring |
| 14—Front wheel inner bearing cup | 41—Front axle steering knuckle tie rod end—left |
| 15—Front wheel hub dust washer | 42—Front axle steering knuckle tie rod end clamp bolts |
| 16—Wheel hub bolt | 43—Front axle steering knuckle arm—left |
| 17—Front axle bushing—lower | 44—Drag link ball dust cover spring |
| 18—Front axle steering knuckle pivot | 45—Drag link ball dust cover |
| 19—Front axle steering knuckle pivot oil seal plug | 46—Drag link ball |
| 20—Wheel brake shoe anchor bolt oil washer retainer | 47—Front axle “I” beam |
| 21—Wheel brake drum | 48—Front axle steering knuckle tie rod body |
| 22—Front wire wheel | |
| 23—Front wheel brake support | |
| 24—Wheel brake cylinder bleeder screw | |
| 25—Wheel brake cylinder bleeder screw cap screw | |
| 26—Front wheel brake inlet connection gasket | |
| 27—Front wheel brake inlet connection | |

REAR AXLE

The rear axle is of the semi-floating type with the differential and pinion assembly mounted in a detachable carrier on the front side of the pressed steel axle housing. The rear side of the axle housing is provided with a cover, easily removed for inspection of the differential assembly.

The drive pinion and shaft are integral, having adjustable tapered roller bearings mounted at the front and rear ends of the shaft. The differential is fitted with adjustable tapered roller bearings mounted in the differential carrier on each side of the differential case. The bearings on the outer ends of the axle shafts are likewise adjustable.

The drive pinion shaft and its bearings are carried as an assembly in the differential carrier.

Differential side and pinion gears may be removed and installed after the carrier assembly has been removed from the axle housing and the differential case removed from the carrier.

A large pin (64, Fig. 4) is passed through the differential case, upon which the differential pinions are mounted. This pin is held in place by a long-pointed screw.

Drive Pinion Adjustment

The drive pinion shaft (53, Fig. 4) and its bearings are carried as an assembly in the differential carrier. The pinion bearing cage is held in place by two cap screws on each side which thread into the carrier, and by nuts threaded onto two studs, one at the top and one at the bottom of the carrier at the front. Split shims (49) are placed between the forward face of the differential carrier and the flange of the pinion bearing cage. These shims serve as an adjustment for the meshing of the drive pinion with the ring gear. This adjustment controls the forward and backward movement of the pinion, and since it is properly set at the factory it will seldom, if ever, be necessary to change the adjustment. In the event that adjustment is ever required at this point it may be made without removing the pinion bearing cage assembly from the carrier by removing the four cap screws and the two stud nuts which hold the cage into the carrier and then removing or installing the proper thickness of shims from the top and bottom between the cage and the carrier, taking care that the same thickness shims are removed or installed at the top as at the bottom.

If, for any reason, it becomes necessary to remove the pinion assembly it is important that the identical shims at the top and bottom be replaced when the pinion cage is reassembled. The pinion and cage assembly is removed by disconnecting the rear universal joint, dropping the propeller shaft, and removing the four cap screws and two stud nuts which hold the pinion and bearing assembly into the differential carrier. The assembly can then be withdrawn from the differential carrier by pulling it straight forward.

Pinion Bearing Adjustment

The rear pinion shaft bearing rollers and cone are pressed onto the pinion shaft tightly against the shoulder of the pinion. The cup of this

bearing is pressed into the bearing cage assembly. A long spacer cage is placed over the pinion shaft against the front face of the cone of the rear bearing. The cup of the front bearing is then pressed into the bearing cage. The roller and cone of the front bearing are fitted onto the pinion shaft and into their cup. Between the rear face of the cone of the front pinion bearing and the front face of the spacer is a set of shims (50) for the purpose of adjusting the pinion shaft bearings. After the front bearing is in place the universal joint flange is pressed onto the splines of the pinion shaft, the rear face of the flange bearing against the front face of the cone of the front bearing. The universal joint flange is then locked rigidly in place by the nut on the front end of the drive pinion shaft. If it should be necessary to adjust the drive pinion bearings the pinion shaft and bearing cage assembly must be removed from the differential carrier. The universal joint flange nut should then be removed. After this nut has been removed the pinion shaft may be pressed out of the universal joint flange and front pinion shaft bearing. It is then possible to remove the roller and cone assembly of the front pinion bearing and either add or remove shims at the front of the bearing spacer to obtain the required adjustment of the drive pinion shaft bearings. Before disassembling this unit to adjust the bearings the end play of the drive pinion shaft should be checked. The correct end play is from .0015" to .0025" (.038 to .063 mm.) when the shaft is pushed forward and backward by hand. If the end play is found to be incorrect the pinion shaft bearings should be adjusted to give the correct end play. A leather and steel oil seal assembly fits over the universal joint flange and is held in place by the same cap screws and stud nuts that hold the pinion shaft and bearing assembly into the differential carrier.

Differential Bearing Adjustment

The differential bearings are assembled to the hubs of each side of the differential case and rest in suitable supports in the differential carrier. Caps over each of these bearings are held in place by means of cap screws which, in turn, are prevented from turning by wires passed through the heads of the cap screws. Bearing adjusting nuts (38 and 60, Fig. 4) are threaded into the bearing supports and caps and press against the outer ends of the bearing cups. These adjusting nuts are made with notches into which the tongued ends of the adjusting nut locks are assembled, which prevent the adjusting nuts from turning. The locks are held in place on the bearing caps by cap screws which, in turn, are locked by wires passed through their heads.

Considerable care must be taken when adjustment of these bearings is being made so as to avoid changing the adjustment of the main drive gear and drive pinion. The best practice is to adjust both bearings exactly the same amount but when proper adjustment is once made at the factory it is seldom necessary to change it. However, if adjustment is ever necessary the adjusting nuts should be turned so as to cause just a slight drag in the bearing and then the adjusting nuts should be backed off one notch.

Axle Shaft Bearing Adjustment

The axle shaft is mounted on two adjustable tapered roller bearings at the outer end of the shaft. The cup of the inner bearing is pressed into the end of the axle housing. The cone and roller assembly is put onto

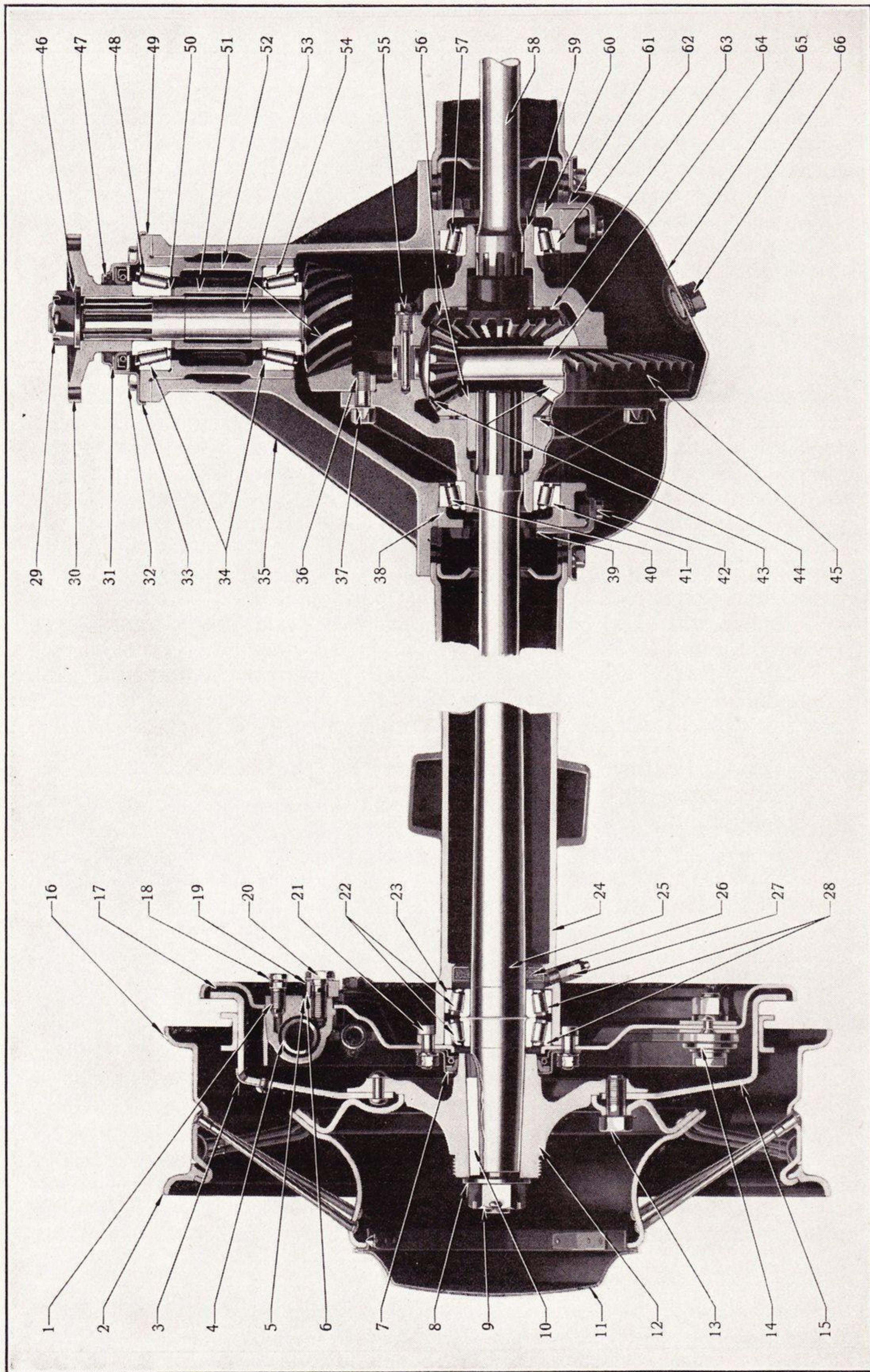


Fig. 4—Rear Axle

the shaft from the inner end of the shaft and pressed against the shoulder on the shaft. The cone and roller assembly of the outer bearing is put onto the shaft from the outer end and pressed up against the shoulder on the shaft and the cone of the inner bearing. The shaft and bearings are then put into the housing and the cup of the outer bearing is pressed into the end of the housing. The entire assembly is held in place by the brake support assembly. Held in place by the same bolts which hold the brake support assembly to the axle housing is an oil seal to prevent leakage of oil into the brake drum.

Between the cup of the inner axle shaft bearing and the shoulder in the end of the axle housing is a series of shims (23, Fig. 4). These shims provide means of adjustment of the axle shaft bearings. These bearings should be so adjusted by adding or removing shims that the end play in the axle shaft is .0025" (.063 mm.). It is necessary that each shaft have its bearings adjusted for the proper end play as the two shafts are entirely independent of one another. In order to make this adjustment it is necessary to remove the axle shaft and bearings, including the cup of the inner bearing. The shims may then be removed.

To Remove Axle Shaft

The wheel, hub and brake drum should be removed from the axle shaft first and then the bolts which hold the outer oil seal and the brake support assembly in place. Before removing the brake support and wheel cylinder assembly it will be necessary to disconnect the brake tube from the wheel cylinder. The outer oil seal and brake support assembly can then be removed. The axle shaft and its bearings can then be withdrawn from the housing. If the cup of the outer bearing binds too tightly in the axle hous-

Fig. 4—Rear Axle

- | | |
|--|---|
| 1—Wheel brake cylinder bleeder screw | 34—Rear axle drive pinion bearing cups |
| 2—Wheel rim side ring | 35—Rear axle drive pinion carrier |
| 3—Wheel brake drum inspection hole cover | 36—Rear axle drive gear screw |
| 4—Rear wheel brake cylinder | 37—Rear axle drive gear screw lock |
| 5—Wheel brake cylinder inlet connection gasket | 38—Rear axle differential bearing adjuster |
| 6—Rear wheel brake cylinder inlet connection | 39—Rear axle differential bearing adjuster lock |
| 7—Rear axle drive shaft bearing oil seal | 40—Rear axle differential bearing cone and rollers |
| 8—Rear axle drive shaft nut washer | 41—Rear axle differential bearing cup |
| 9—Rear axle drive shaft nut | 42—Rear axle differential bearing adjuster lock screw |
| 10—Rear axle drive shaft key | 43—Rear axle differential pinions |
| 11—Wire wheel hub shell cap | 44—Rear axle differential gear thrust washer |
| 12—Rear wire wheel hub | 45—Rear axle drive gear |
| 13—Wire wheel hub bolt | 46—Rear axle drive pinion flange nut washer |
| 14—Wheel brake shoe anchor bolt oil washer retainer | 47—Rear axle drive pinion bearing oil seal washer |
| 15—Wire wheel brake drum | 48—Rear axle drive pinion bearing cone and rollers |
| 16—Rear wire wheel | 49—Rear axle drive pinion adjusting shims |
| 17—Rear wheel brake support | 50—Rear axle drive pinion bearing adjusting shims |
| 18—Wheel brake cylinder bleeder screw cap screw | 51—Rear axle drive pinion bearing spacer |
| 19—Wheel brake cylinder inlet connection bolt gasket | 52—Rear axle drive pinion bearing cage |
| 20—Wheel brake cylinder inlet connection bolt | 53—Rear axle drive pinion and shaft (integral) |
| 21—Rear wheel brake support to axle bolt | 54—Rear axle drive pinion bearing cone and rollers |
| 22—Rear axle drive shaft bearing cone and rollers | 55—Rear axle differential pinion shaft lock screw |
| 23—Rear axle drive shaft bearing shims | 56—Rear axle differential gears |
| 24—Rear axle housing | 57—Rear axle differential bearing cone and rollers |
| 25—Rear axle drive shaft—left | 58—Rear axle drive shaft—right |
| 26—Rear axle drive shaft oil washer | 59—Rear axle differential case |
| 27—Rear axle drive shaft bearing lubricant nipple | 60—Rear axle differential bearing adjuster |
| 28—Rear axle drive shaft bearing cups | 61—Rear axle differential bearing adjuster lock |
| 29—Rear axle drive pinion flange nut | 62—Rear axle differential bearing cup |
| 30—Rear axle drive pinion flange | 63—Rear axle differential gear thrust washer |
| 31—Rear axle drive pinion bearing oil seal retainer | 64—Rear axle differential pinion shaft |
| 32—Rear axle drive pinion bearing cage screw | 65—Rear axle housing cover |
| 33—Rear axle drive pinion bearing oil seal | 66—Rear axle housing cover plug |

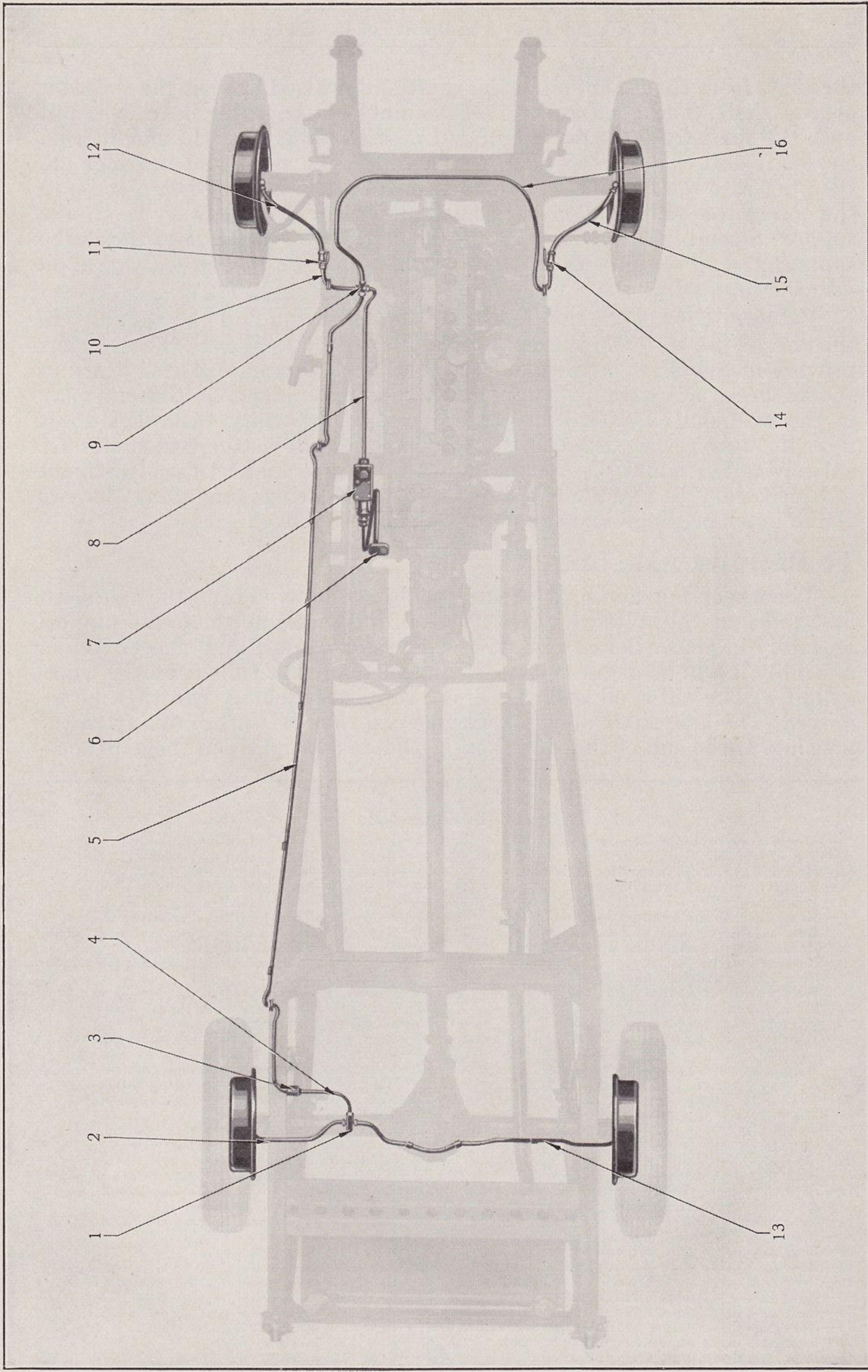


Fig. 5 Hydraulic Four-Wheel Brake System

ing to withdraw the assembly by hand a suitable puller should be used on the axle shaft to avoid damage to the bearings.

Lubrication

The differential and pinion bearings, as well as all axle gears, should be lubricated with fluid gear lubricant. In temperatures below 0° Fahrenheit this lubricant should be diluted with one-half pint (.24 l.) of colorless kerosene. Lubricant should be poured into the differential housing through the filler hole in the rear of the cover. This hole is located so as to serve as a guide in determining the proper amount to be put into the housing. Lubricant should be level with the bottom of this hole. (Lubrication Chart.)

The axle shaft bearings should be lubricated through the lubricant nipple (No. 27, Fig. 4) with fluid gear lubricant every 5000 miles (8000 km.) by means of the high-pressure gun.

BRAKES

The Chrysler Imperial Eight hydraulic four-wheel brakes are self-equalizing and their adjustment is easy. There are no operating rods or cross shafts, and, consequently, nothing to rattle and no joints to lubricate. Simple in construction, the brakes depend only upon the fundamental displacement principle of hydraulics for their operation and equalization, and when treated with a reasonable amount of consideration will need but little attention.

Operation

Connected to the brake pedal is a piston which operates in a master cylinder, bolted to the left hand side of the flywheel housing. Leading from this master cylinder to cylinders at each of the four brake supports are metal tubes and heavy non-expanding hose. In each wheel cylinder are two pistons, each of which presses against the upper ends of the brake shoes. The whole system (that is, all cylinders and lines) is full of liquid, all air having been expelled in the process of filling. There is no pressure in the system when the brakes are not in operation and the brake shoe facings are held clear of the drums by the brake shoe return springs.

When the brake pedal is depressed, the piston in the master cylinder moves forward, expelling into the lines sufficient liquid to force out the pistons in each of the brake wheel cylinders until the brake shoe facings come in contact with the drums.

There can be no braking pressure applied to any one drum until all facings are in contact with their drums. The greater force required to give braking pressure cannot be supplied until the resistance in all wheel cylinders is built up to that force. This is governed by the physical law that force or pressure exerted upon a column of liquid is expended equally in all directions. With the eight brake shoes at the point of braking, the ad-

Fig. 5—Hydraulic Four-Wheel Brake System

- | | |
|--|--|
| 1—Rear axle brake tube tee | 10—Brake tube—frame tee to front hose connection—left |
| 2—Rear axle brake tube—left | 11—Front brake tube hose frame bracket |
| 3—Rear brake hose frame bracket | 12—Brake tube flexible hose |
| 4—Brake tube flexible hose | 13—Rear axle brake tube—right |
| 5—Brake tube—frame tee to rear hose bracket | 14—Front brake tube hose frame bracket |
| 6—Brake pedal | 15—Brake tube flexible hose |
| 7—Brake master cylinder and reservoir (integral) | 16—Brake tube—frame tee to front hose connection—right |
| 8—Brake tube—master cylinder to frame tee | |
| 9—Brake tube frame tee | |

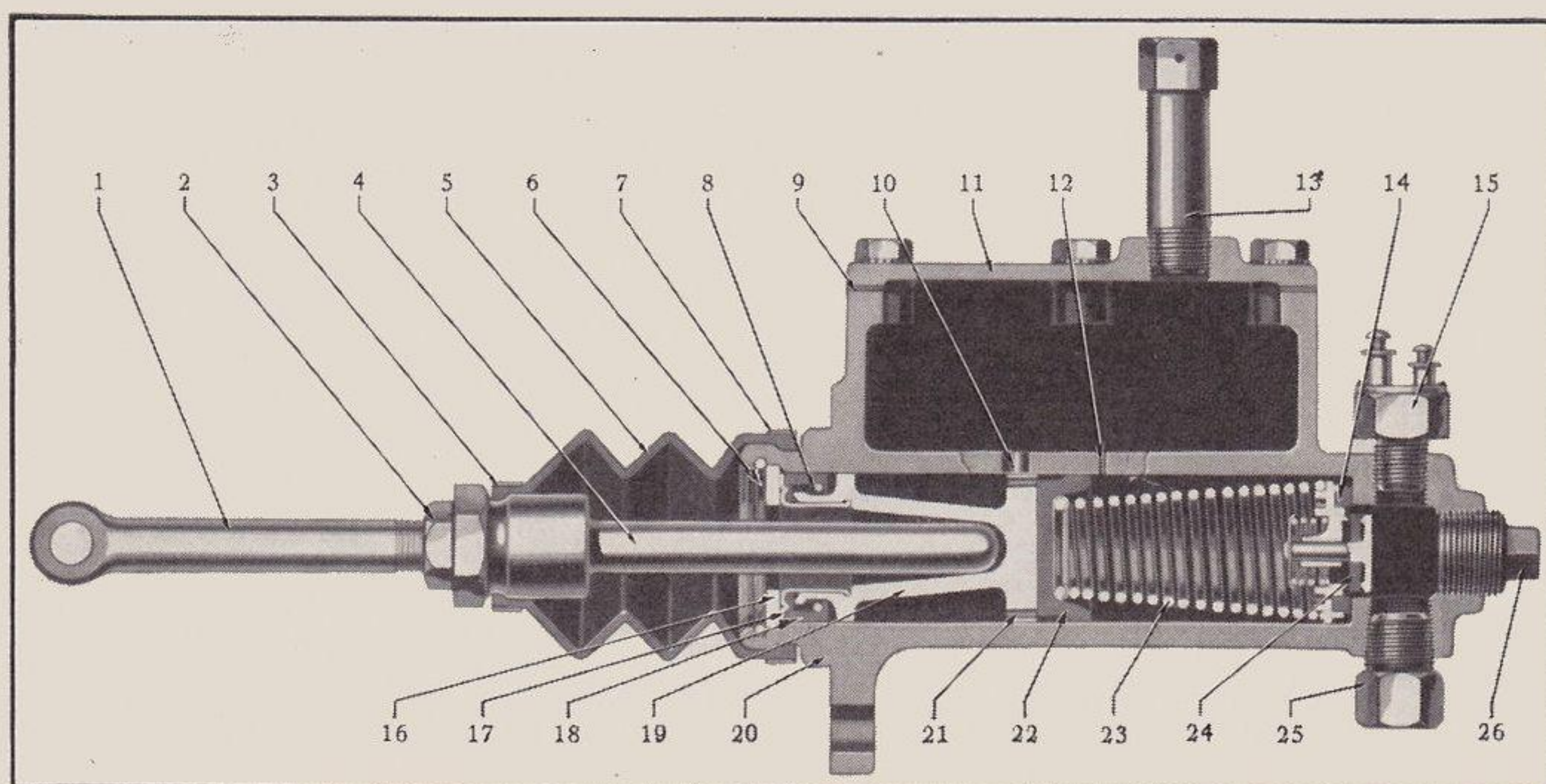


Fig. 6—Master Cylinder and Reservoir

- | | |
|--|---|
| 1—Brake master cylinder piston push rod end | 14—Brake master cylinder inlet valve |
| 2—Brake master cylinder piston push rod end lock nut | 15—Signal lamp switch |
| 3—Brake master cylinder boot strap—small | 16—Brake master cylinder piston stop |
| 4—Brake master cylinder piston push rod | 17—Brake master cylinder secondary cup retainer |
| 5—Brake master cylinder boot | 18—Brake master cylinder secondary cup |
| 6—Brake master cylinder piston stop lock wire | 19—Brake master cylinder piston |
| 7—Brake master cylinder boot strap—large | 20—Brake master cylinder and reservoir body |
| 8—Brake master cylinder secondary cup expander | 21—Liquid port in piston |
| 9—Brake master cylinder reservoir gasket | 22—Brake master cylinder piston cup |
| 10—Secondary liquid port | 23—Brake master cylinder piston return spring |
| 11—Brake master cylinder reservoir cover | 24—Brake master cylinder outlet valve |
| 12—Compensating relief port | 25—Brake master cylinder outlet nipple |
| 13—Brake master cylinder reservoir cover tube | 26—Brake master cylinder body plug |

ditional pressure of the foot pedal is naturally transmitted equally to all brakes, giving a positive braking action, absolutely self-equalizing in its application.

When the brake pedal is released, the pistons in the wheel cylinders are returned to their stops by the brake shoe return springs, forcing the liquid, used in displacing the pistons, through the lines back into the master cylinder.

General

The reservoir should never be above three-quarters full or below half full of the genuine Chrysler Hydraulic Brake Liquid, which is obtainable at any Chrysler Service Station. This should be used to the exclusion of all other liquids, but if for some reason the genuine liquid is not available for an immediate requirement a suitable substitute liquid may be made by thoroughly mixing equal parts of medicinal castor oil and No. 5 denatured alcohol free from acid (wood alcohol should never be used). This formula should only be used when the genuine Chrysler Hydraulic Brake Liquid is not available and it is important that the improvised liquid be entirely drained from the system as soon as possible and replaced with Chrysler Hydraulic Brake Liquid. Chrysler Hydraulic Brake Liquid is made in very much the same manner, but certain chemicals are added by a very lengthy, as well as difficult, process which neutralizes acids found in the formula prescribed above.

Master Cylinder Reservoir

The reservoir is an integral part of the master cylinder and is connected to it by drilled passages. The reservoir must always be at least one-half full and never more than three-quarters full of fluid because of the possibility of drawing air into the system. The reservoir must be closed at all times except when inspecting, bleeding, or adding fluid in order to prevent evaporation and the entrance of dirt into the reservoir. Cleanliness in this regard is of the utmost importance. The air above the liquid is at atmospheric pressure and when liquid is drawn from the reservoir into the master cylinder its volume is replaced with air. This is accomplished by the breather in the reservoir filler cap. The reservoir is filled through the hole at the top onto which this filler cap (and breather) is screwed and care must be taken to make certain that the cap is tightened securely when the opening is not being used for filling, bleeding, or inspecting.

Master Cylinder

The master cylinder (Fig. 6) is mounted on the left side of the flywheel housing and is of the "compensator" type.

In the top of the master cylinder is a small hole (12, Fig. 6) which is uncovered when the piston cup is in its return position, so that fluid is free to pass between the master cylinder and reservoir.

In the outlet end of the master cylinder is a double-acting valve held in place by the master piston return spring. Application of the brake pedal forces the fluid through the inner valve (24) to the brake tubes and wheel cylinders. When the brakes are released the master piston (19) is returned to its released position by the return spring in the master cylinder. The fluid is returned through the outer (larger) valve (14) from the wheel cylinders by the action of the brake shoe return springs. When the pressure of the brake shoe return springs balances that of the master piston return spring the valve closes. The small compensating hole in the top of the master cylinder wall together with the inlet and outlet compensating valve assembly in the master cylinder compensate for expansion and contraction of the fluid in the lines due to temperature changes.

Should the fluid not be returned from the system fast enough or in sufficient quantity to equal the displacement by the master piston while being returned to its release position, a vacuum will cause the lip of the master piston cup (22) to turn in, allowing fluid to pass from the reservoir to the master cylinder through a by-pass (21) in the piston. Fluid thus introduced into the system will allow the master cylinder to operate the brakes, even though all of the fluid displaced by previous operation of the brakes were not returned to the master cylinder. Any excess fluid thus introduced into the system will be returned to the reservoir through the small compensating hole in the top of the master cylinder when the master piston has reached its release position.

The foot pedal is set for clearance between the pedal and the floor board, on each individual car, at the factory. Readjustment in the field will not be necessary and improper adjustment will result in decreasing the effective travel of the master cylinder piston.

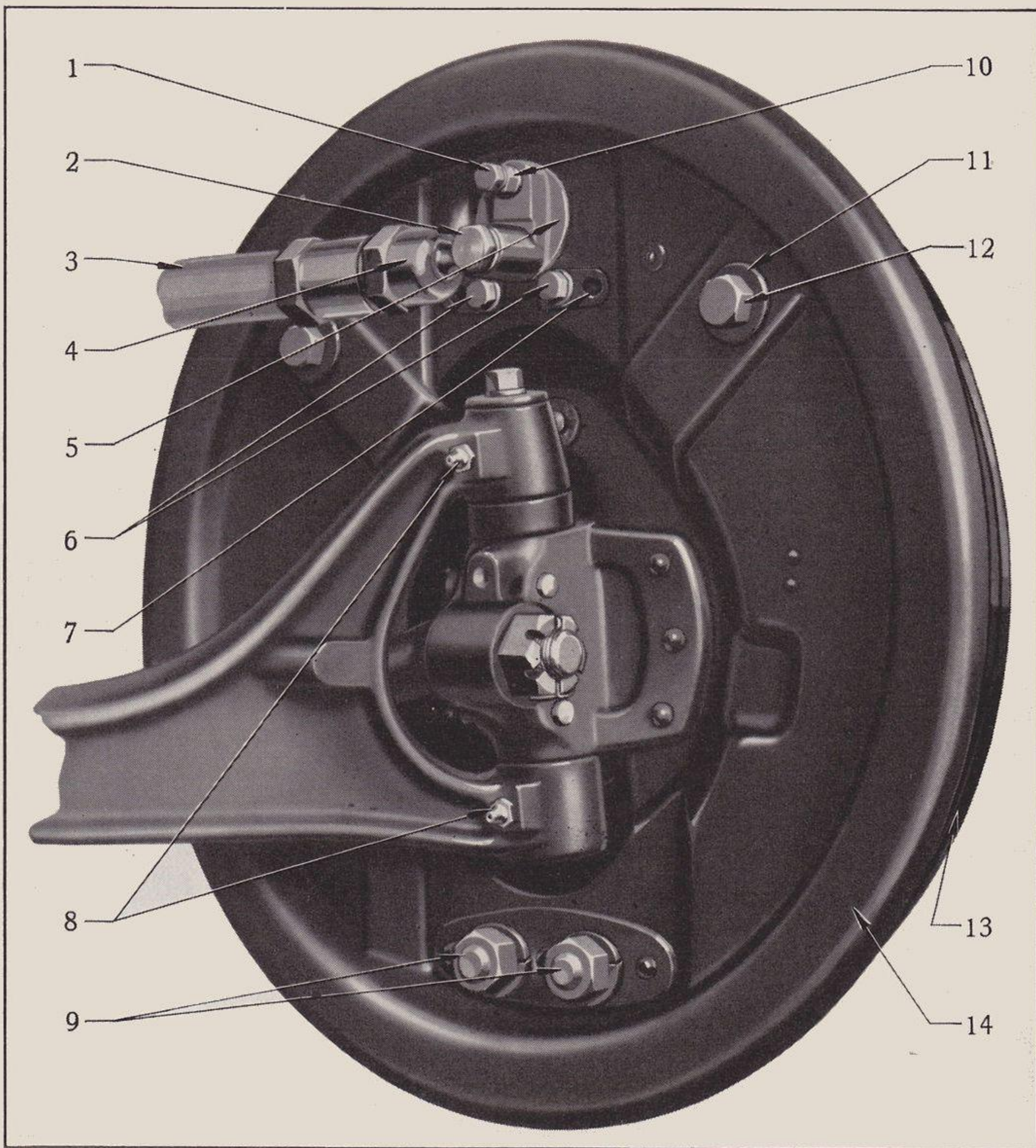


Fig. 7—Brake Shoe Cam Adjustments

- | | |
|--|--|
| 1—Wheel brake cylinder bleeder screw cap screw | 8—Lubricant nipples |
| 2—Wheel brake cylinder inlet connection bolt | 9—Wheel brake shoe anchor bolts |
| 3—Wheel brake flexible hose | 10—Wheel brake cylinder bleeder screw |
| 4—Wheel brake cylinder inlet connection | 11—Wheel brake shoe adjusting pin washer |
| 5—Wheel brake cylinder | 12—Wheel brake shoe adjusting pin |
| 6—Wheel brake cylinder attaching screws | 13—Wheel brake drum |
| 7—Wheel brake cylinder inlet connection pilot hole cover | 14—Front wheel brake support |

Wheel Cylinders

The wheel or operating cylinders are bolted to the brake supports at each of the four wheels. They contain two opposed pistons and each piston presses against the upper end of a brake shoe. The brake liquid is forced (by pedal pressure) into the wheel cylinders between the pistons which, in turn, forces the pistons in opposite directions. The pistons, being against the ends of the brake shoes, force the brake shoe facings against

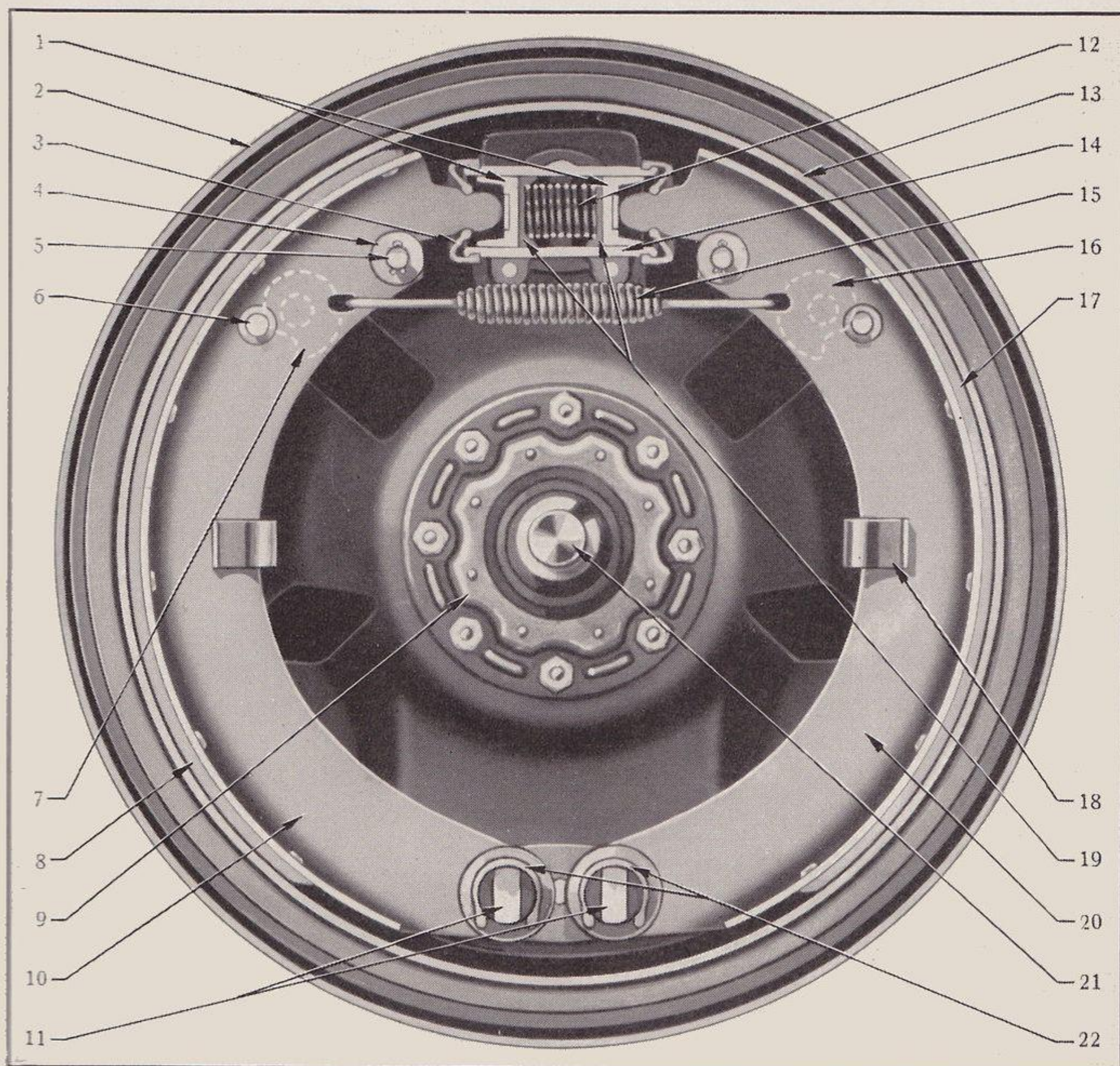


Fig. 8—Wheel (Foot) Brake

- | | |
|--|---|
| 1—Rear wheel brake cylinder pistons | 12—Rear wheel brake cylinder piston cup spring |
| 2—Rear wheel brake support | 13—Wheel brake drum |
| 3—Wheel brake cylinder boot | 14—Rear wheel brake cylinder body |
| 4—Wheel brake shoe guide pin spring washer | 15—Wheel brake shoe return spring |
| 5—Wheel brake shoe guide pin | 16—Wheel brake shoe adjusting cam |
| 6—Wheel brake shoe stop pin | 17—Wheel brake shoe facing—rear |
| 7—Wheel brake shoe adjusting cam | 18—Wheel brake shoe guide |
| 8—Wheel brake shoe facing—front | 19—Rear wheel brake cylinder piston cups |
| 9—Rear axle drive shaft bearing oil seal | 20—Wheel brake shoe and facing assembly—rear half |
| 10—Wheel brake shoe and facing assembly—front half | 21—Rear axle drive shaft |
| 11—Wheel brake shoe anchor bolts | 22—Wheel brake shoe anchor bolt washer |

the brake drums. Such is the action of the parts in the wheel cylinders when the brakes are applied and, when foot pressure on the pedal is relieved, the brake shoe return spring (15, Fig. 8) reverses the direction of travel of the shoes, pistons and liquid.

A bleeder valve is located at 10, Fig. 7, through which liquid and air are expelled when bleeding the system.

Bleeding the Lines

The cap screw (1, Fig. 7) should be removed and the bleeder nipple and hose attached (part of car tool equipment) to the bleeder valve in the

wheel cylinder with a small open end wrench. The bleeder valve (10) should be opened from $\frac{1}{2}$ to $\frac{3}{4}$ of a turn, but not completely removed. One end of the bleeder rubber tubing is fitted with a threaded nipple which is to be screwed into the bleeder valve and the other end of the tubing laid into a clean and dry container, preferably a pint bottle. The latter should be resting on the floor.

Liquid should then be pumped through the system by pressing the brake pedal slowly to the limit of its travel, but it is imperative that the reservoir be more than half full of liquid. The reservoir filler cap should be removed before starting to pump the liquid through the system so that the level of the liquid in the reservoir can be easily seen. This will also permit the addition of more liquid as soon as necessary.

When the reservoir is full, the foot pedal can be given ten full strokes or pumping actions before it is necessary to refill the reservoir. The pumping action of the pedal will force liquid and air together out of the system. The pumping should be continued until it is observed that no air bubbles are coming out of the system with the liquid. Generally ten or fifteen full pumping strokes of the pedal will be sufficient for bleeding one cylinder.

When the bleeding operation of one cylinder has been completed the bleeder valve should be closed and the cap screw (1) returned to its place. Then another wheel cylinder should be bled in the same manner. It is best to only bleed one cylinder at a time.

Extreme care must be exercised at all times not to permit any brake liquid or grease from the hands or otherwise to come in contact with the brake shoe facings.

It will be necessary to bleed the lines to remove air from the system after disconnecting one of the wheel brake cylinders for removal of axle parts, or if a connection or tube should leak.

Leaks

An excessive consumption of liquid denotes a leak in the system. This can easily be detected by applying very heavy pressure to the brake pedal while the car is standing still and then checking over the various connections to see the point of leakage.

CAUTION: Pistons or any other parts of the master cylinder or brake wheel cylinders should never be removed. Special tools are required to correctly assemble these parts. There is nothing in these cylinders to give trouble, but, if it should be necessary to make a service repair, a complete cylinder assembly should be replaced.

To Adjust Wheel Brakes

Adjustment of the brake shoes, to compensate for wear of the facing, is made by turning the brake shoe adjusting cams. This is accomplished by turning the nut (12, Fig. 7). The car wheel should first be raised sufficiently to spin free from the floor. Then the nut (12) should be turned until it is observed that the brake shoe facing is just touching the drum. This can best be determined by spinning the wheel and at the same time turning the adjusting nut. Then, when the facing touches the drum, the adjusting nut should be turned in the opposite direction so that the facing is just free from the drum. The adjusting nut is held in position by a friction spring and does not require locking. When one brake shoe has been adjusted the other shoe should be adjusted by turning the other

adjusting nut and spinning the wheel in the same manner. There are two brake shoes for each wheel and each shoe has a separate adjusting nut.

Initial adjustments of new brakes (brakes on which new facings have been installed) are made in a different manner and the instructions given under "Refacing Brakes" should be followed.

Refacing Brakes

The surface of the brake shoes carrying the facing is very carefully machined to the proper shape. The facing is of moulded segments which are very carefully ground after being placed on the shoes.

In the event that it becomes necessary to reface the brakes due to facing wear, new shoe and facing assemblies should be installed. These shoe and facing assemblies are obtainable at Chrysler Service Stations and should be used to insure the satisfactory operation of the brakes.

The brake shoes can be removed after the wheel and brake drum have been removed by removing the brake shoe return spring and the brake shoe anchor pins. The anchor pins are removed by taking off the anchor pin nut and pulling the anchor pin out.

After installing new shoes and facings it will be necessary to adjust the anchor pins (11, Fig. 8), which are eccentric, so that the proper clearance between the facing and the drum will be assured. To do this it will be necessary to have a special precision tool so that adjustments can be made and clearances checked accurately. The anchor pins and cam adjustments should be so set that the clearance between the bottom of the facing and the drum is .006" (.152 mm.) and the clearance at the top .012" (.305 mm.).

Due to the method of grinding the facing at the factory it will not be necessary to run the facings in, and under no condition should facings be burned.

The adjustment of the brake shoe anchor pin is a factory adjustment and should not be disturbed. The only time it will be necessary to change this adjustment is after the brake shoe has been removed for some reason.

CAUTION: DO NOT OPERATE BRAKE PEDAL WHILE THE BRAKE DRUMS ARE REMOVED.

Liquid Expansion

Liquid expansion and contraction are automatically taken care of to eliminate brake drag by means of a breather in the head of the master cylinder reservoir.

Hand Brake

The hand brake is of the external contracting band type, hand-controlled, and operates on a drum mounted on the front flange of the front universal joint.

Your brakes are vital to your safety. Chrysler Imperial Eight brakes are extremely efficient. When adjustment or service is necessary have this done only in a **Chrysler Service Station** by Chrysler methods and with genuine Chrysler materials.

Be Sure of Your Safety

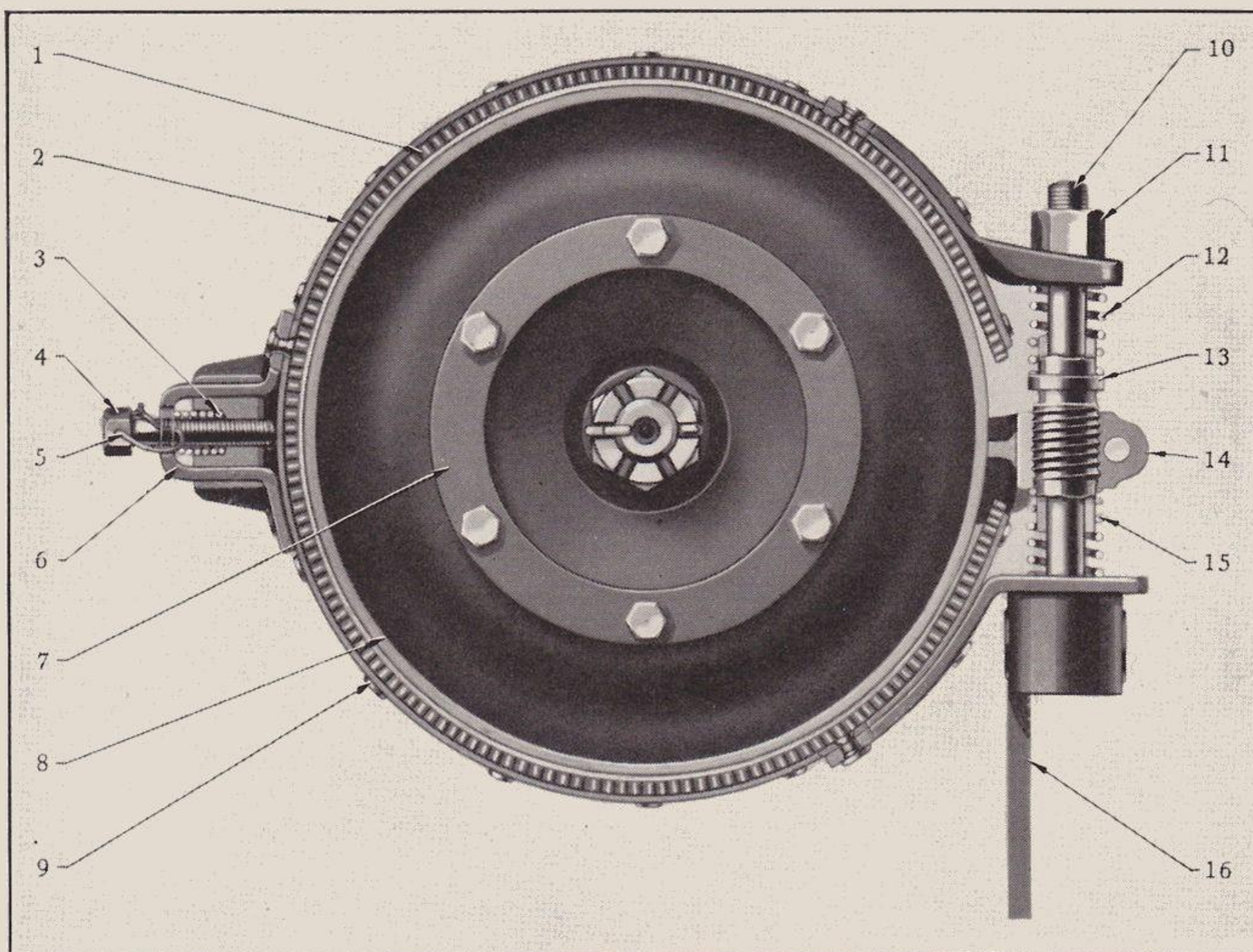


Fig. 9—Hand Brake

- | | |
|--------------------------------|-----------------------------|
| 1—Brake band lining | 9—Brake lining rivet |
| 2—Brake band | 10—Adjusting bolt |
| 3—Brake anchor spring | 11—Adjusting bolt nut |
| 4—Brake anchor adjusting screw | 12—Release spring |
| 5—Anchor screw lock wire | 13—Adjusting sleeve |
| 6—Brake anchor clip | 14—Adjusting sleeve bracket |
| 7—Universal joint flange | 15—Release spring |
| 8—Brake drum | 16—Brake cam |

Adjustment is made by first jacking up the rear wheels and setting the brake hand lever in the extreme forward position. Then the brake anchor adjusting screw (4, Fig. 9) should be turned so as to give $\frac{1}{16}$ " (1.59 mm.) clearance between the drum and the lining, and it should be observed that the anchor clip moves freely on the anchor bracket while operating the brake. Next the adjusting sleeve (13) should be turned to give $\frac{1}{16}$ " (1.59 mm.) clearance throughout the remainder of the lower half of the drum. The adjusting screw clamping bolt should be tightened after this adjustment has been completed and then the adjusting nut (11) turned so as to give $\frac{1}{16}$ " (1.59 mm.) clearance between the upper half of the band and the drum. The band should conform to the drum at all points except at the ends as shown in the illustration.

CLUTCH

The clutch is of the single dry plate type, comprising a pressure plate assembly having twelve pressure springs, four release levers and a drop-forged hardened steel splined hub. A rubber-cushioned driving disc, having asbestos composition facing riveted to it, serves as the transmission driving member.

A sliding sleeve carries the clutch release bearing. This bearing should be lubricated with medium fibre grease every 2000 miles (3200 km.) from a compression grease cup on the right side of the engine rear support. The cup should be given a few turns, then clutch released for a few seconds with the engine running and the operation repeated in order to pack the bearing thoroughly.

The clutch must be operated dry. A hole is drilled in the bottom of the housing to permit any small leakage of oil, from rear crankshaft bearing, clutch release bearing, or transmission, to drain off.

Adjustments

Fig. 10 illustrates the parts of the clutch assembly and should be referred to in connection with these instructions. The release bearing and pedal must be in their proper positions. This is accomplished by setting the clutch pedal stop screw (No. 32, Fig. 10), so that the forward face of the release bearing (10) is exactly $\frac{1}{16}$ " (1.59 mm.) from the clutch release levers. Then the release fork (27) should be adjusted by increasing or decreasing the length of the clutch release fork adjusting link (43) to locate the pedal as high as possible without interference with the floor board after the release bearing and pedal are in the proper engaged position. To increase the length of the adjusting link, back off on the nut (48), and the nut (49). The length of the linkage may be decreased by reversing the directions of the adjusting nuts (48 and 49). The clutch pedal should have from $\frac{15}{16}$ " to 1" (23.81 to 25.40 mm.) of free movement before any resistance can be felt.

The clutch release fork adjusting link has no connection with the free movement of the clutch pedal, but is provided to adjust the clearance at the toe board by changing the angle of the pedal.

The pedal stop screw (32) controls the free movement of the pedal. It is imperative, therefore, that *the difference be distinguished between these two adjustments.*

The clutch springs should measure $1\frac{11}{16}$ " (42.86 mm.) when compressed to 140 to 155 pounds (63.03 to 70.30 kgs.) pressure.

The practice of continuously resting the foot on the clutch pedal, while driving, is harmful to the throw-out bearing and should be avoided. The weight of the foot holds the clutch throw-out yoke against the release bearing with consequent rapid wear and noise; reduces tension of the clutch springs, causing slippage and loss of power; causes rapid wear of the facings, producing sluggish clutch action, rattles and knocks, besides necessitating more frequent lubrication of the bearing.

The ball bearing at the rear of the clutch shaft receives its lubrication from the transmission.

To Remove Clutch

Remove the transmission (page 72). Then remove the lower half of the clutch housing.

CAUTION: Before removing the clutch, mark the clutch cover No. 19, Fig. 10, and the flywheel to insure reinstalling the clutch in the same relative position to maintain the original balance.

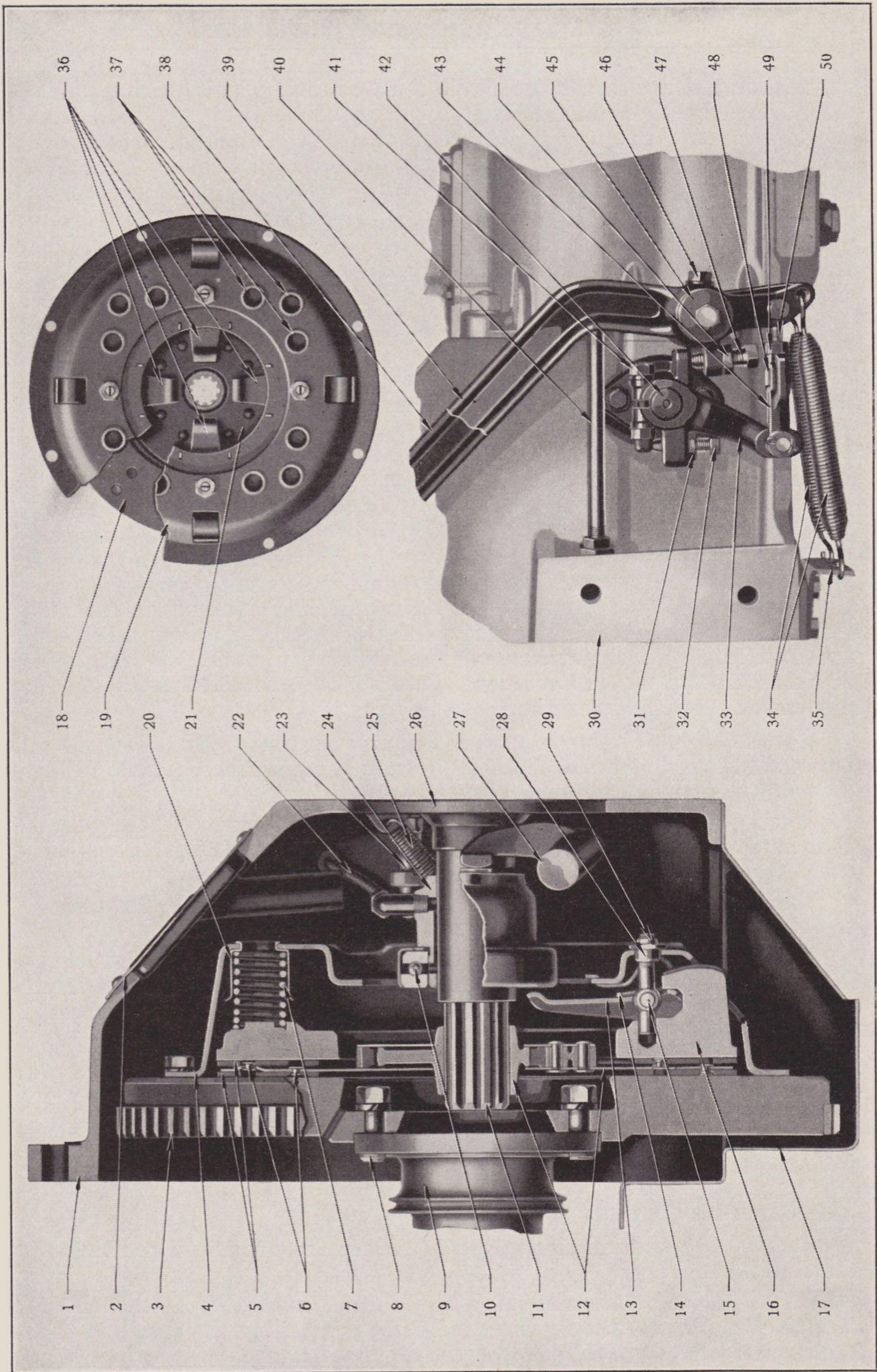


Fig. 10—Clutch and Pedal Adjustments

Remove the eight bolts that hold the clutch back plate to the flywheel. To avoid distortion of the clutch back plate these bolts should be turned out one full turn each in progression until the clutch spring tension is entirely relieved. They may then be taken out and the clutch assembly removed.

Care should be exercised to avoid damage to the clutch release levers.

To Install Clutch

The clutch driving disc (No. 12) and the clutch cover and pressure plate (Nos. 4 and 16) should be mounted in place with the eight bolts. The bolts should only be drawn up tight enough to hold the clutch in position. Next, the transmission should be installed, using care not to bend or distort the clutch driving disc. After installing the transmission, the eight bolts should be drawn up until they are finger tight; they should then be given one full turn each in progression to draw the clutch down evenly and securely into place. Detailed instructions for the clutch adjustment should then be carefully followed.

COOLING SYSTEM

The radiator is of the cellular type, connected by short pieces of hose to the engine. The fan is driven by the crankshaft through a V-type belt. This belt also drives the generator. The water pump impeller in the cylinder block, just behind the fan, is driven by the fanshaft.

Thermometer

The temperature of the water in the cylinder block is indicated by the thermometer in the instrument panel. After 10 or 15 minutes of driving it should register between 150° and 180° Fahrenheit (65.8° to 82.2° Centigrade), depending upon load and temperature of the air. When driving at high speed for several miles and in very warm weather, the thermometer may register a higher temperature. If the clutch is disengaged and the engine stopped or its speed reduced considerably while traveling at high

Fig. 10—Clutch and Pedal Adjustments

- | | |
|---|--|
| 1—Clutch housing | 27—Clutch release fork |
| 2—Clutch housing hand hole cover | 28—Clutch eye bolt nut |
| 3—Flywheel | 29—Clutch eye bolt |
| 4—Clutch cover | 30—Clutch housing |
| 5—Clutch driving disc facings | 31—Clutch release fork lever stop screw lock nut |
| 6—Clutch driving disc facing rivets | 32—Clutch release fork lever stop screw |
| 7—Clutch spring | 33—Clutch release fork lever |
| 8—Flywheel bolt | 34—Clutch and brake pedal pull-back spring |
| 9—Crankshaft | 35—Clutch and brake pedal pull-back spring anchor |
| 10—Clutch release bearing | 36—Clutch release levers |
| 11—Transmission drive pinion | 37—Clutch spring seats |
| 12—Clutch driving disc and hub | 38—Brake pedal and bushing |
| 13—Clutch release lever | 39—Clutch pedal and bushing |
| 14—Clutch release lever spring | 40—Brake master cylinder piston push rod end |
| 15—Clutch eye bolt pin | 41—Clutch release fork lever clamp bolt |
| 16—Clutch pressure plate | 42—Clutch release fork |
| 17—Clutch housing pan | 43—Clutch release fork adjusting link yoke |
| 18—Clutch facing | 44—Brake pedal stop screw lock nut |
| 19—Clutch cover | 45—Clutch and brake pedal shaft washer |
| 20—Clutch spring seat | 46—Clutch and brake pedal shaft bracket screw—long |
| 21—Clutch driving disc | 47—Brake pedal stop screw |
| 22—Clutch release bearing grease tube | 48—Clutch release fork adjusting link nut |
| 23—Clutch release bearing sleeve guide | 49—Clutch release fork adjusting link check nut |
| 24—Clutch release bearing sleeve | 50—Clutch release fork adjusting link |
| 25—Clutch release bearing sleeve pull-back spring | |
| 26—Transmission drive pinion bearing retainer | |

speed or during a long hard pull at lower speeds, there will be a strong tendency for the thermometer to indicate a rapid rise in the temperature. This is due to the reduced speed of water and air circulation through the radiator and does not indicate the necessity of attention to the cooling system. If, under such conditions, the car be stopped, the engine should be allowed to run slowly so as to maintain the water circulation. If, for any reason, the water is boiled, some of it will be expelled from the system through the overflow pipe and should be replenished as soon as possible.

If the thermometer fails to register, the assembly should be replaced. Repairs or adjustments to this instrument should not be attempted.

While working on the engine care should be taken to avoid bending or straining the thermometer tube, especially while the cylinder head is being removed. The thermometer bulb is mounted in the cylinder head and must be removed before the cylinder head is removed.

A leak in the thermometer bulb may be detected by bubbles rising from the point of leakage, if the bulb and tube are immersed in hot water. Leaks cannot be repaired but can be prevented by an occasional inspection to see that the tube is not chafing or rubbing at any point and has no sharp kinks in it. If no leaks appear the difficulty, if any, may be due to the indicating hand binding in the gauge.

Radiator Shutters

The radiator shutters used are of the automatic type, entirely regulated and controlled by a thermostat located in the water outlet passage of the cylinder head.

With the engine and the water in the radiator cold, the connecting rod should be adjusted so the thermostat exerts just enough force to close the shutters. This is accomplished by increasing or decreasing the length of the connecting rod where it attaches to the thermostat, by turning the nuts and changing their position on the rod.

With the engine hot and the water in the cooling system 160° Fahrenheit (71° Centigrade) or above, the shutters should be wide open.

The shutter operating pivots should receive a few drops of light engine oil every 5000 miles (8000 km.). The lower shutter bearings which are located where the bottom of the shutters meet the radiator shell, should also be lubricated with light engine oil every 5000 miles (8000 km.).

Care

The cooling system should be drained (drain cock at bottom of radiator) and flushed occasionally to remove dirt and sediment. If the radiator is removed from the car, the ideal way to flush the radiator is to invert it and force the water through the bottom connection to remove large particles collected in the top tank. Very hard or lime water should not be used in the system. Because of the scale-forming chemicals it contains, its use will cause scale to form on the walls of the inside of the radiator and cylinder water jackets, which, in a short time, will restrict the circulation of water. The water passages in the radiator core are very small and, if care is taken to use soft water at all times, these small water passages will not become clogged with the scale, which is very difficult to remove.

Lead and oil paint should never be put on the radiator core because it forms an insulation that retards dissipation of heat.

Hose connections should be kept tight. Soft hose should be replaced with new, firm pieces. Mounting studs and the screws holding the core in the shell must be kept tight. Radiator compounds or other liquids should not be used for stopping small leaks because they generally block the passages in the radiator, which necessitates an overhauling.

Steaming

When steam comes out of the radiator it is an indication that the water is not circulating properly or that an insufficient supply of water is in the system. Very often if the water in the radiator is frozen, the radiator will emit steam, because ice has obstructed the circulation, and the water around the cylinders is being boiled. A frozen cooling system should be thawed as promptly as possible. There is a great possibility of ice causing much damage to the engine water jackets, pump, and radiator, especially if the overflow pipe in the radiator is clogged.

If an engine is run at a high temperature due to an insufficient supply of water or obstructed water circulation, care must be taken to allow the engine to cool before refilling the radiator. Cold water making contact with an extremely hot cylinder is likely to crack the cylinder casting.

Adjustments

The fan belt is adjusted by loosening the two bolts at the bottom of the generator, one at the front and the other at the rear, which hold the generator on its mounting. The bolt which locks the generator in place in the slotted segment at the front of the generator should then be loosened. The generator can then be swung outward on its bracket, thereby tightening the fan and generator drive belt. The belt should be adjusted reasonably tight that is, taut enough between the pulley so that a deflection of more than $\frac{3}{4}$ " (19.1 mm.) in each direction is not easily made with the fingers, and kept tight at all times so as to prevent belt whip, slippage and noise.

The water pump packing nut should be turned to the right or clockwise for tightening and should be turned up lightly, just enough to stop any leak at the packing nut. Binding the pump shaft should be avoided by not tightening beyond the point of stopping the leak. If, however, the leak is not stopped by turning the adjusting nut, the packing should be replaced.

Non-Freezing Solutions

At the first indication of freezing weather the cooling system should be filled with a good non-freezing solution. Denatured alcohol and water in proper proportions make a very good solution, but care should be taken to prevent its spilling on the lacquer finish of the car. If this does happen, the solution should be quickly flushed off the lacquer finish with water so as to avoid spotting or bleaching the finish, because alcohol is a solvent of lacquer. Alcohol evaporates from water and, when refilling the radiator is necessary, it is generally best to refill with clear denatured alcohol instead of water. Such a solution should be tested about once a week to make certain that it will not freeze in the prevailing temperatures.

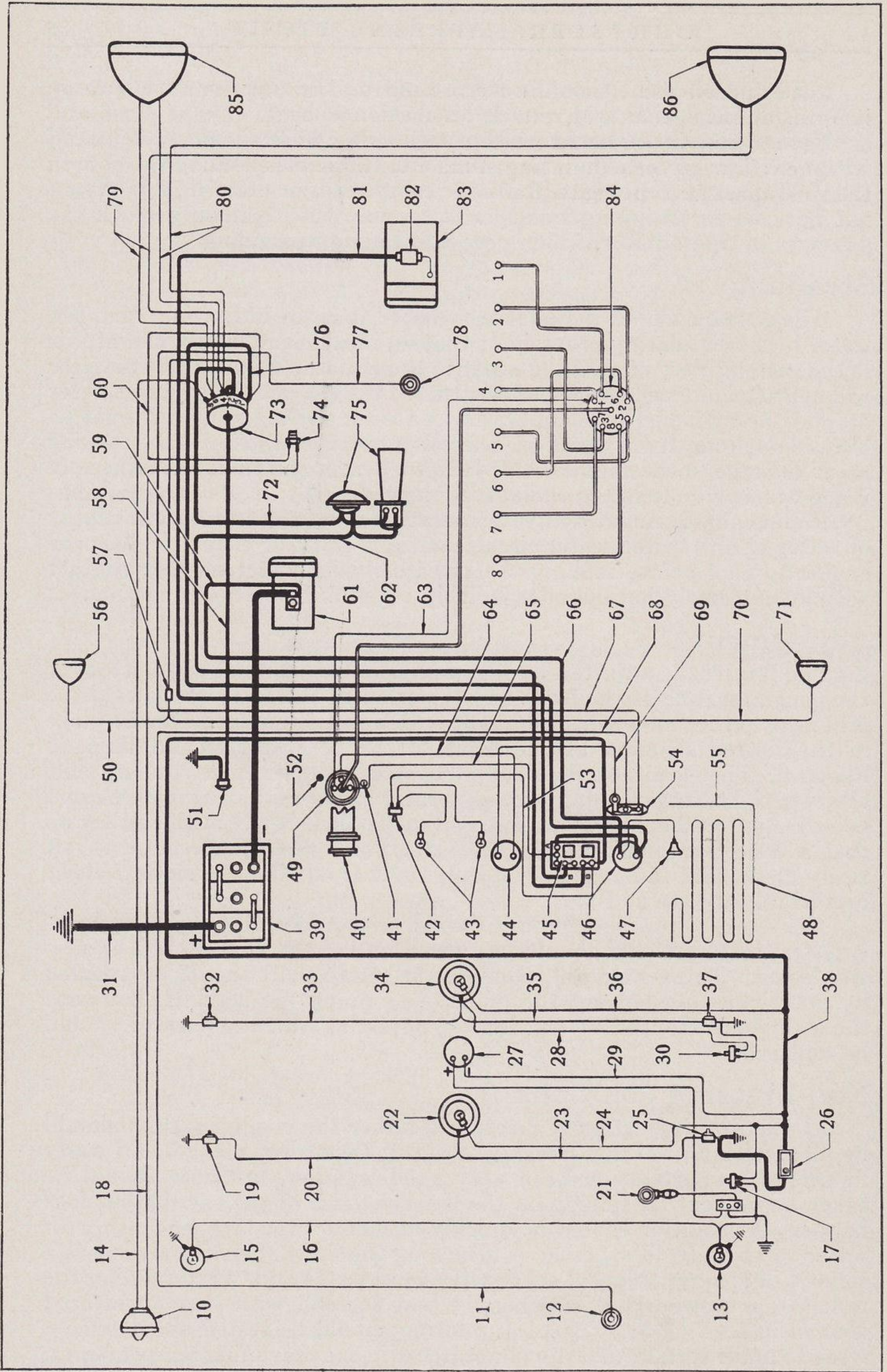


Fig. 11—Wiring Diagram

Under no circumstances should a calcium chloride solution be used. It has a chemical action on different metal parts of the entire system and in a short time will cause damage.

The following formula is dependable for a good non-freezing solution at all temperatures indicated:

Freezing Point Fahrenheit	Amount of Alcohol	Amount of Glycerine (See Note)	Amount of Ethylene Glycol	Freezing Point Centigrade
20°	4 qts. (3.79 l.)	6½ qts. (6.15 l.)	4½ qts. (4.26 l.)	- 6°
10°	6½ qts. (6.15 l.)	8¼ qts. (7.81 l.)	7¼ qts. (6.86 l.)	-12°
0°	9¼ qts. (8.75 l.)	10½ qts. (9.94 l.)	8½ qts. (8.05 l.)	-17°
-10°	10½ qts. (9.94 l.)	12½ qts. (11.83 l.)	10¼ qts. (9.70 l.)	-23°
-20°	11¾ qts. (11.12 l.)	14¾ qts. (14.00 l.)	11¼ qts. (10.65 l.)	-28°
-30°	13 qts. (12.30 l.)	15¾ qts. (14.91 l.)	12 qts. (11.36 l.)	-34°

Note: The quantity indicated is proper for the Chrysler Imperial Eight, which has a capacity of 6½ gallons or 26 quarts (5.41 Imperial gallons, 24.60 liters) in the cooling system.

ELECTRICAL SYSTEM

The six-volt, one-wire system is used. The several units composing the system are: the starting motor, generator, relay, ignition timer, distributor and coil, storage battery, lights and horns.

Several of the above units are grounded; that is, the car frame serves as one conductor for the current. When disconnecting any unit from the

Fig. 11—Wiring Diagram

- | | |
|--|-------------------------|
| 1-8—Spark plugs | 47—Cigar lighter |
| 10—Tail and signal lamp | 48—Small black braid |
| 11—Small blue braid | 49—Ignition coil |
| 12—Fuel gauge (tank unit) | 50—Small black braid |
| 13—Corner lamp—right | 51—Horn push button |
| 14—Small black braid | 52—Timer terminal |
| 15—Corner lamp—left | 53—Small black braid |
| 16—Small yellow braid | 54—Oil gauge switch |
| 17—Corner lamp switch | 55—Antenna lead-in |
| 18—Small red braid | 56—Parking lamp—left |
| 19—Automatic door switch—left | 57—Connector |
| 20—Small white braid | 58—Medium black braid |
| 21—Telephone transmitter (Sedan-Limousine) | 59—Medium red braid |
| 22—Dome lamp (7-Pass. Sedan and Sedan-Limousine) | 60—Small red braid |
| 23—Small white braid | 61—Starting motor |
| 24—Small red braid | 62—Medium green braid |
| 25—Automatic door switch—right | 63—Small black braid |
| 26—Cigar lighter (Sedan-Limousine) | 64—Small blue braid |
| 27—Telephone receiver (Sedan-Limousine) | 65—Small black braid |
| 28—Small yellow braid | 66—Medium red braid |
| 29—Small black braid | 67—Small white braid |
| 30—Dome lamp switch | 68—Small blue braid |
| 31—Cable (battery to ground) | 69—Small black braid |
| 32—Automatic door switch | 70—Small black braid |
| 33—Small white braid | 71—Parking lamp—right |
| 34—Dome lamp (5-Pass. Sedan and Close-Coupled Sedan) | 72—Medium green braid |
| 35—Small white braid | 73—Lighting switch |
| 36—Small red braid | 74—Signal lamp switch |
| 37—Automatic door switch | 75—Horns |
| 38—Medium red braid | 76—Medium green braid |
| 39—Battery | 77—Small white braid |
| 40—Ignition switch, lock and coil | 78—Oil gauge (pan unit) |
| 41—Battery terminal | 79—Small red braid |
| 42—Instrument lamp switch | 80—Small black braid |
| 43—Instrument lamps | 81—Medium black braid |
| 44—Fuel and oil gauge (panel unit) | 82—Relay |
| 45—Current limit relay | 83—Generator |
| 46—Ammeter | 84—Ignition distributor |
| | 85—Headlamp—left |
| | 86—Headlamp—right |

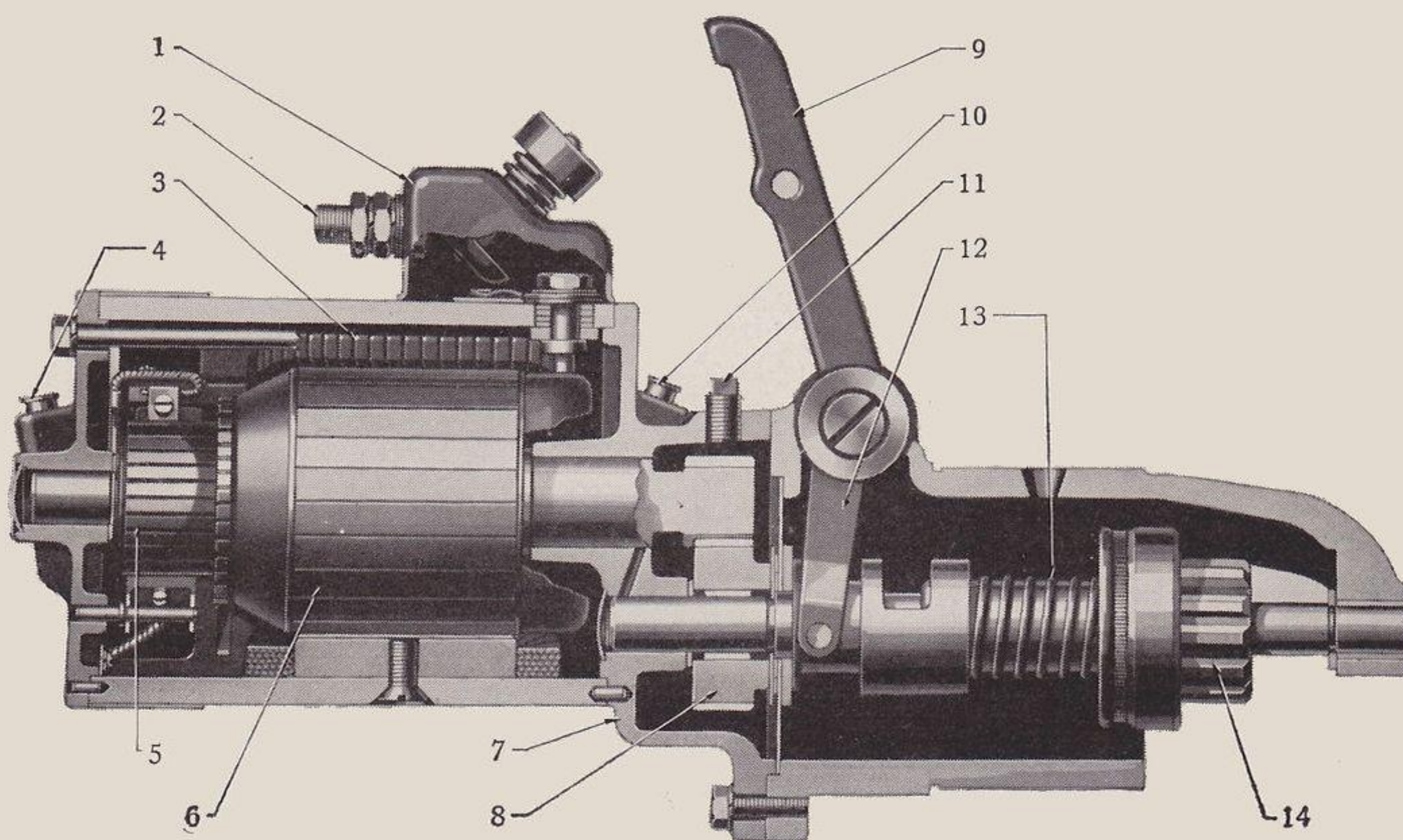


Fig. 12—Starting Motor

- 1—Starting switch
- 2—Terminal post
- 3—Field coil
- 4—Oiler
- 5—Commutator
- 6—Armature
- 7—Gear housing

- 8—Reduction gear
- 9—Contact arm
- 10—Oiler
- 11—Grease hole plug
- 12—Shift yoke
- 13—Shift spring
- 14—Pinion

system, the exposed terminals should be taped to prevent them from grounding (touching) on any metallic part of the car. Should this occur it would short-circuit either the generator or the storage battery, and would probably damage either or both of these units beyond repair. The cables and wires should be inspected occasionally to make sure all are in good condition and are not rubbing against a sharp edge, as such rubbing or chafing wears away the cable insulation and short-circuits the cable, with the attendant danger of fire or damage to the storage battery.

All terminals and terminal binding nuts should be kept tight and free from dirt and oil. An occasional inspection of the electrical equipment by an experienced automotive electrician is advisable because it reduces the chances of trouble on the road.

The engine, being insulated from the frame by a rubber mounting, requires a "ground" connection. This is located on the outside of the left hand side member of the frame under the nuts of the bolts holding the engine and steering gear.

Starting Motor

The starting motor is of reduction gear type and is mounted on the left side of the flywheel housing. It is held in place by a heavy set screw and lock nut. The starting motor pinion is shifted into mesh with the gear teeth on the flywheel by a foot-operated mechanism. In connection with this gear-shifting mechanism is a switch which closes the electric circuit for the starting motor just after the gears have been meshed.

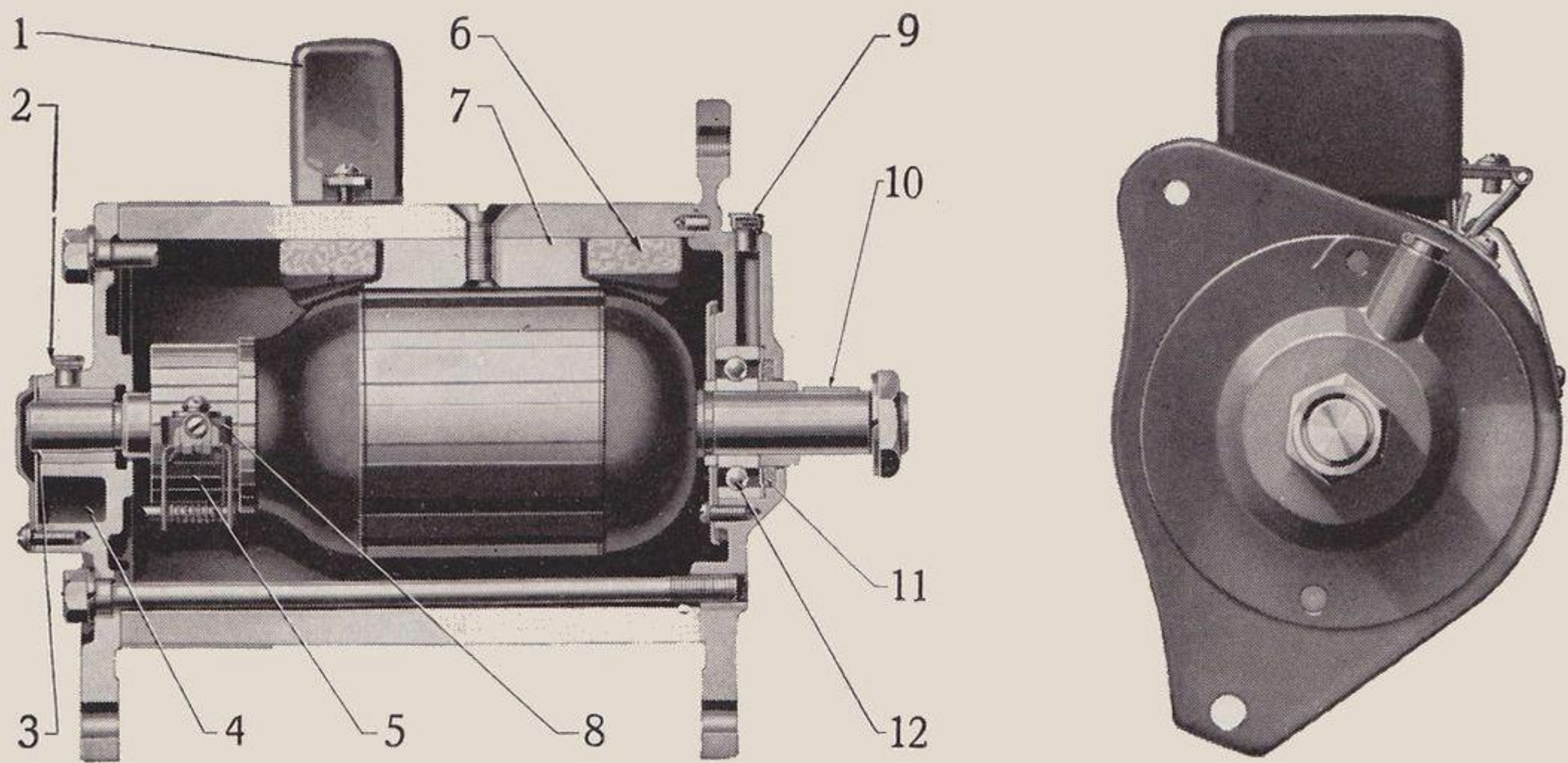


Fig. 13—Generator

1—Relay
2—Oiler
3—Bearing
4—Oil reservoir

5—Commutator
6—Field coil
7—Field pole
8—Brush

9—Oiler
10—Pulley key
11—Oil seal
12—Bearing

The commutator should be kept clean and free from oil and grease; if it appears dirty or rough, it should be cleaned with number 00 sandpaper. Emery paper should never be used for this purpose. If this treatment does not smooth the commutator, the armature should be removed and the commutator turned in a lathe. The mica should not be undercut on motor commutator. The brushes should move freely in the brush holders and the full contact area should bear on the commutator.

The oilers in each end of the starting motor housing should receive a few drops of light engine oil every 2000 miles (3200 km.). Medium cup grease should be forced into the gear case at the pipe plug hole (11, Fig. 12) at rear end of starting motor body about every 10,000 miles (16,000 km.). The commutator should never be oiled. The connections of the gear-shifting mechanism should receive a few drops of oil each 5000 miles (8000 km.) to maintain free action.

The starting motor is removed by first disconnecting the cables. Then the cotter pin and clevis pin, connecting the gear-shifting lever with the foot rod, should be removed. The lock nut should be loosened and the set screw, entering the flywheel housing above the starting motor, removed. The starting motor may then be pulled straight out of the flywheel housing toward the front of the car.

Generator

The generator is mounted on the left side of the engine at the front and driven by the fan belt. It generates current for the entire electrical system and feeds it to the storage battery. The generator may be easily and quickly removed by removing the mounting bolts.

The oil reservoirs at each end of the armature shaft should be filled with light engine oil every 2000 miles (3200 km.).

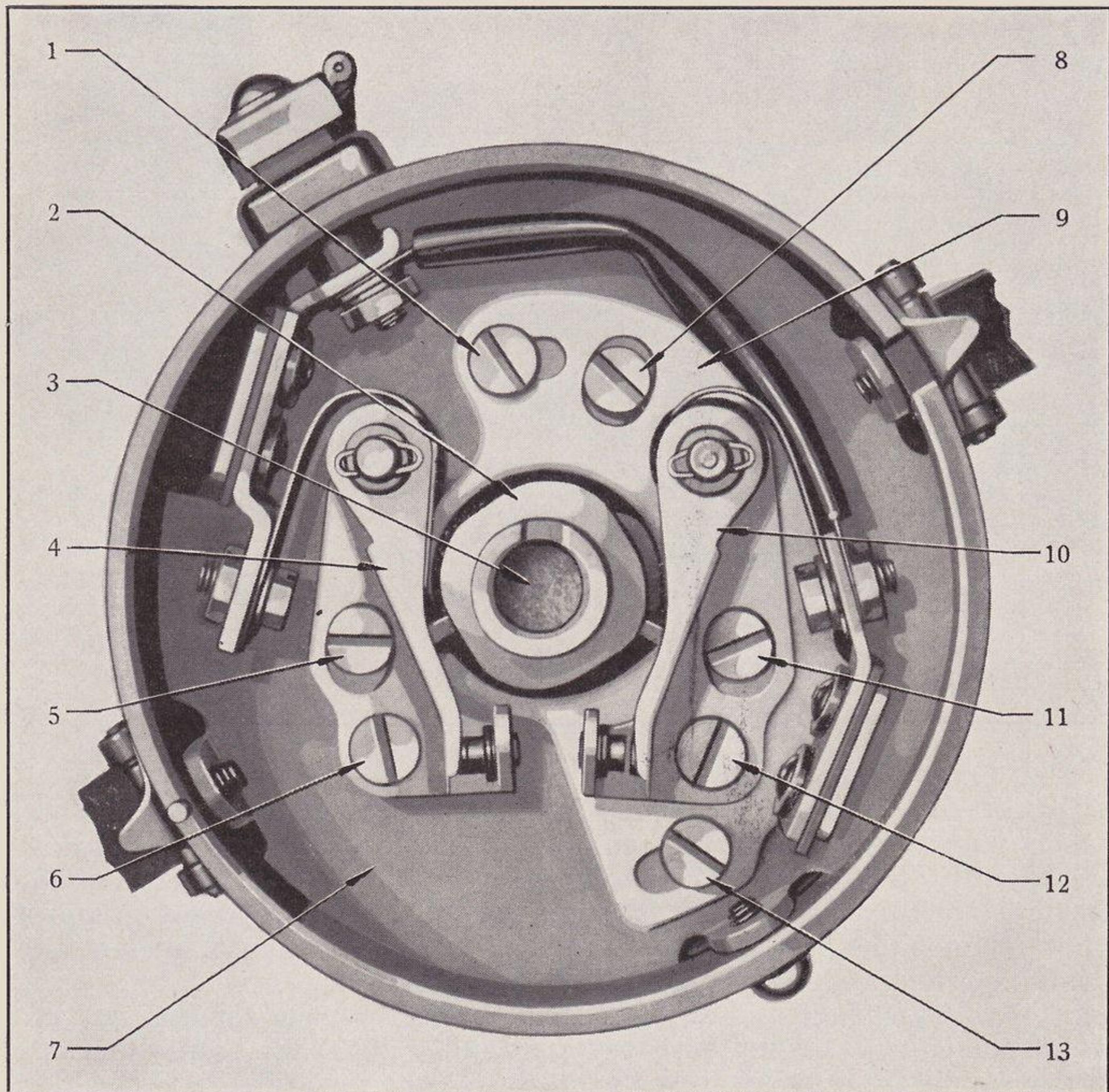


Fig. 14—Distributor

- | | |
|---------------------------------------|--|
| 1—Adjustable base plate locking screw | 8—Adjustable base plate adjustment screw |
| 2—Cam | 9—Adjustable base plate |
| 3—Oil wick | 10—Breaker arm |
| 4—Breaker arm | 11—Breaker point adjustment screw |
| 5—Breaker point adjustment screw | 12—Breaker point plate lock screw |
| 6—Breaker point plate lock screw | 13—Adjustable base plate locking screw |
| 7—Stationary base plate | |

The generator begins charging at 8 to 10 miles per hour (12 to 16 kilometers per hour) and reaches its maximum output (with cold generator) at 20 to 22 miles per hour (32 to 35 kilometers per hour). For ordinary driving the rate should never exceed 12 amperes. The charging rate may be regulated by rotating the "third" brush holder. This is made accessible by removal of the commutator end cover band. The "third" brush rocker ring clamp screw may then be loosened and the "third" brush holder rotated in the direction of armature rotation to increase the rate or against armature rotation to decrease.

If the generator charging rate is not up to the proper figure the difficulty may be due to a loose generator and fan drive belt. The belt should

be adjusted as described under "Cooling System, Adjustments". (Page 35.)

Relay

The relay, assembled on the top of the generator body, automatically breaks the circuit between the generator and the battery when the engine speed is too low for the generator to charge the battery. It automatically closes the circuit at the proper engine speed so the generator can charge the battery.

The relay requires no lubrication or other attention. The adjustment of the movable arm should not be disturbed.

Distributor

The distributor, which is of the four lobe cam and double breaker arm type with condenser on the outside of the base, is accessibly mounted on the cylinder head and driven through a vertical shaft from the camshaft. The opening of the breaker points by the cam on the distributor shaft interrupts the flow of primary current, which induces an electro-motive force in the secondary winding of the coil, mounted on the instrument panel. The high-tension current is delivered to the center terminal of the distributor cap, and thence through the rotor to the spark plugs. The cylinders are fired in the order 1-6-2-5-8-3-7-4.

The ignition switch is connected to the coil. The contacts of the switch are enclosed in a steel housing built on the coil. When the switch is turned "off" the circuit is broken and at the same time the coil is disconnected, making it impossible to start the engine by another source of electricity.

Adjustment

The two sets of breaker points must be adjusted to open exactly equal amounts [.020" (.508 mm.)] with the breaker arms on the highest point of the cam.

The cam is of the four lobe type and causes one pair of breaker points to open at a time. One pair of breaker points controls the spark to one set of four cylinders (1-2-8-7) and the other set of breaker points controls the spark to the other four cylinders (6-5-3-4); therefore, the opening of both sets of breaker points must be equal or the spark timing will be different in the two sets of four cylinders. *The points open alternately.*

Spark Advance

For all ordinary road driving the spark control button should be in the advanced position, which is pushed into the instrument panel. When cranking the engine by hand, the spark control button should be pulled all the way out. The automatic advance will take care of all other conditions.

To Adjust Point Opening

Before attempting to set the breaker points they should be inspected to determine if there is a deposit on them. Any deposit on the points may be easily and quickly removed with a file.

The rotor should be removed and the engine turned by means of the hand crank until one breaker arm rests on a high point of the cam. The

gap between the pair of breaker points which have opened should be .020" (.508 mm.). If necessary to correct the adjustment of the gap, the breaker point plate lock screw should be loosened and the gap increased or decreased, as required, by means of the breaker point adjustment screw.

The engine should then be turned until the other breaker arm is resting on a high point of the cam, then this pair of breaker points should be adjusted in the same manner and should have exactly the same amount of opening [.020" (.508 mm.)].

To Set Ignition Timing

The breaker points should be adjusted to .020" (.508 mm.) opening and the manual spark control button placed in the fully advanced position. The $\frac{1}{8}$ " (3.18 mm.) pipe plug should be removed from the cylinder head above No. 8 piston and a gauge rod placed through the hole and in contact with the piston head. The crankshaft should be rotated until No. 8 piston is coming up on exhaust stroke and stopped when the piston is .047" (1.193 mm.) before top dead center. The screw which clamps the distributor timing lever to the distributor should be loosened and the distributor cap removed to see that the rotor brush is at No. 1 spark plug cable terminal. The distributor clamp screw should next be loosened and the distributor rotated in an anti-clockwise direction, as viewed from above, until No. 1 cam begins to separate the breaker points. While doing this the distributor rotor should be pressed against the direction of rotation to be certain that all backlash is removed. The clamp screw should then be tightened and the distributor cap reinstalled as well as the spark plug cables connected to the proper spark plugs and terminals on the distributor cap. The spark control button should be checked for full advance and retard.

Firing Order

The firing order of the cylinders is 1-6-2-5-8-3-7-4. The wires from the spark plugs should be connected to the terminals on the distributor corresponding with the number of the cylinder in which the spark plugs are placed. Number 1 cylinder is that nearest the radiator.

The wiring diagram (Fig. 11) indicates the location of the distributor terminals for the different spark plugs.

The breaker arms are set at the factory so that the breaker points will open at exactly the proper amount with relation to the positions of the pistons. This means that both pairs of breaker points are synchronized.

Synchronization

The breaker points will in time change their synchronization slightly because of wearing or burning off unequally. Ordinarily when the points are cleaned and readjusted to the proper opening the synchronization is automatically corrected, but if after the breaker points have been cleaned and adjusted the engine seems rough in its operation, especially so when idling and accelerating, the difficulty may be caused by the breaker points not being synchronized. This should be checked, and corrected if necessary, by an authorized Chrysler Service Station or Delco-Remy Service Station (United Motors Service, Inc.).

Ignition Coil

The ignition coil needs little attention other than to be kept clean, dry and well grounded. All terminals on the coil must be tight.

Spark Plugs

The gap between the spark plug points must be .022" (.559 mm.). Too wide a gap will cause misfire, especially at high speeds when operating at wide open throttle, while a small gap causes poor idling. Uniform gap setting insures evenness of engine firing.

Dirty or fouled spark plugs should be cleaned with a wire scratch brush to remove any carbon deposit from the exposed end of the porcelain. The plugs should then be placed in the engine and the car operated at a fairly high rate of speed for a few miles.

Present day engines are capable of being operated at a very high speed. This extreme flexibility possible in these engines, requires that the spark plugs be maintained in good condition to secure maximum efficiency. It is, therefore advisable to replace spark plugs every 10,000 miles (16,000 km.) of service. The installation of new plugs properly adjusted will have a marked effect upon the performance of the engine and aid materially in keeping the engine in condition for smooth flowing maximum power.

The spark plugs furnished with the car will give excellent performance under all average operating conditions and are obtainable at all Chrysler Service Stations. The use of so-called carbon-proof spark plugs and others having smaller diameter electrodes should be avoided. Such spark plugs will cause the engine to miss when operating under heavy loads.

Suggestions

Ignition trouble will make itself known by the engine misfiring or refusing to start. All troubles are not directly traceable to the ignition system, as a sticking float, improper carburetor setting, improperly adjusted choke and leaking manifold gaskets, may be the cause of the engine's failure to start.

An actual misfiring of an engine which has previously operated perfectly and on which no carburetor adjustments have been made, is a warning of ignition trouble. This is usually due to cracked spark plug porcelains, fouled plugs—due to excessive choking, old or defective spark plug cables, or to pitted or badly burned points. Ignition trouble is usually from this last cause. The points should be re-dressed, if not too badly burned, and reset.

When the engine fails to start, the ignition system should be checked.

This should be entrusted to a competent repairman as this work requires an experienced person to check the system and locate the cause of the engine's failure to start.

Lights

The head, parking and tail lights are all controlled by the lower lever above the steering wheel. When the lever is in the vertical or central position, no connection is made. When the lever is turned to the right, the parking and tail lights are connected. When the lever is turned to the

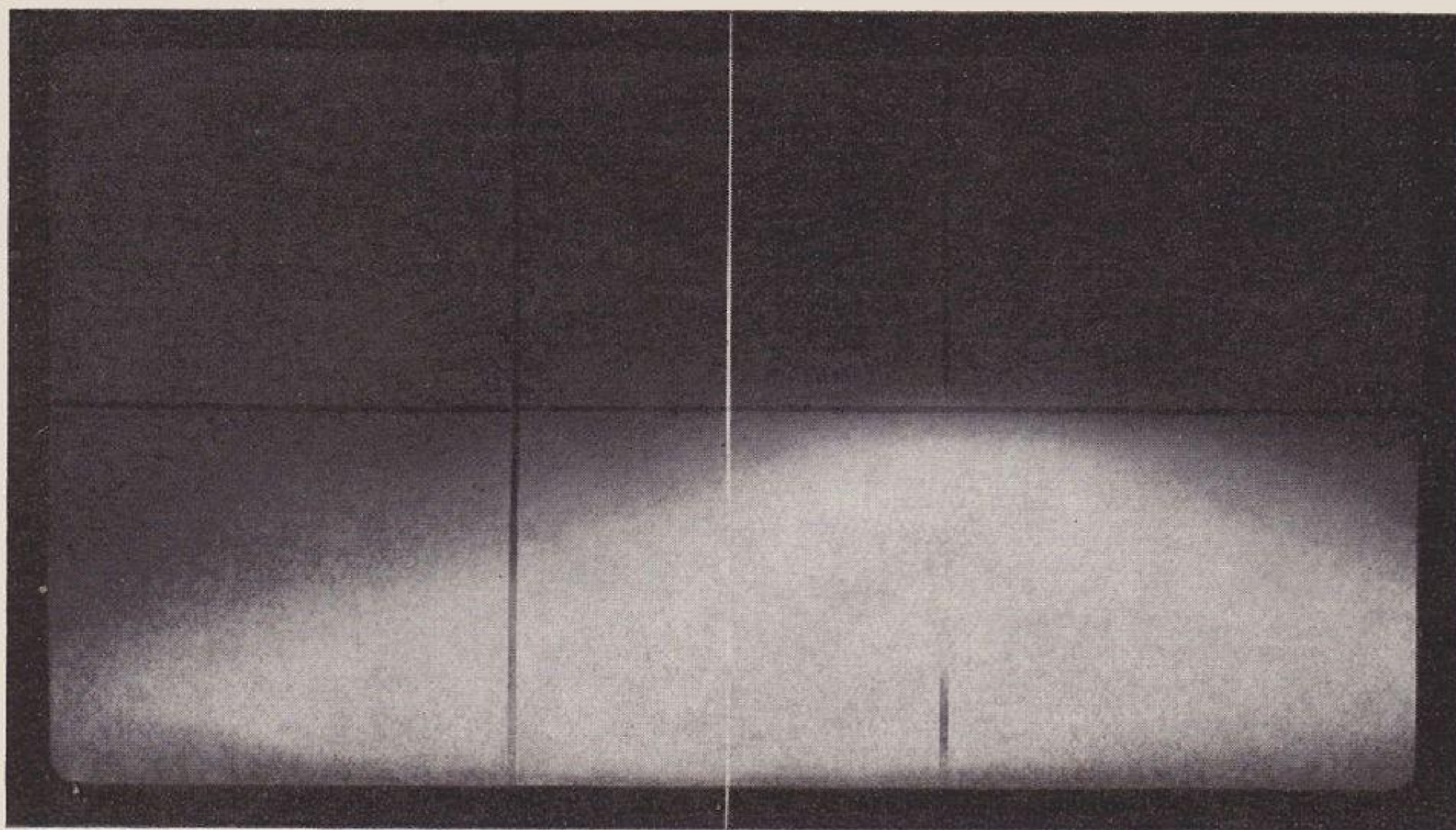


Fig. 15—Upper beam of right hand headlamp correctly focused and aimed

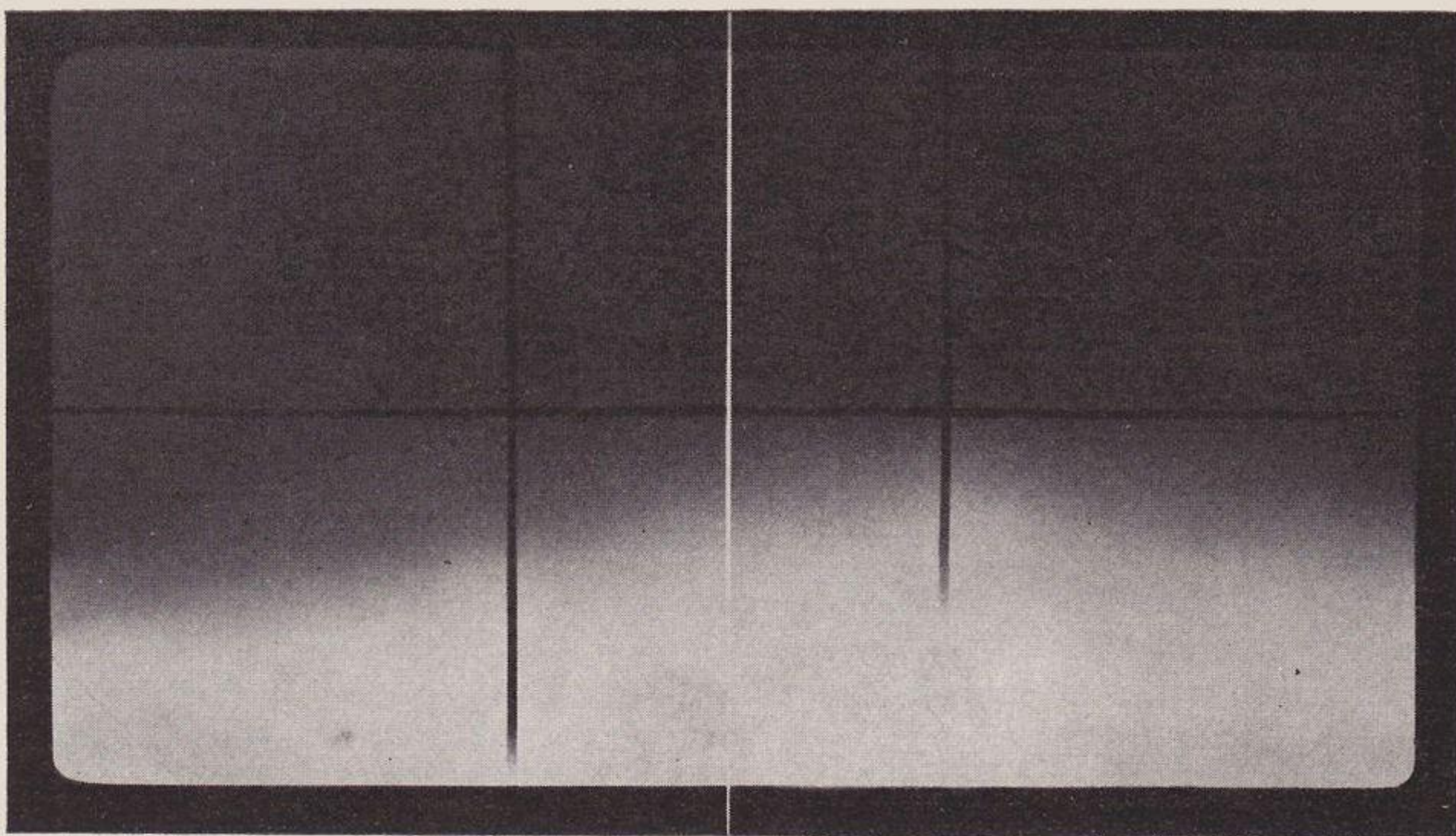


Fig. 16—Lower beam of headlamp shown in Fig. 15

left one notch, the lower filaments of the headlamps and tail light are connected. The upper filaments of the headlamps are connected by moving the control lever one notch farther to the left. The instrument panel light is controlled by a separate switch on the instrument board.

Signal Light

A hydraulic switch assembled in the brake master cylinder completes the circuit for the rear signal lamp when the brake pedal is depressed.

Headlamp Adjustment

The car should be placed, with normal passenger load, on a level surface with the headlamps located twenty-five feet (7.6 m.) from a garage door or light-colored vertical wall.

A horizontal line should be drawn on this surface at a height of the lamp centers. A center point should be located on this line by sighting through the center of the rear window of the car and in line with the radiator cap. Equidistant from this center point two vertical lines should be drawn at a distance from each other equal to the distance between the centers of the headlamps. These two lines will be immediately ahead of and in line with the respective headlamps.

With the lighting switch lever above the steering wheel turned to the left ("high" position), one lamp should be adjusted (with lens in place) while the other is covered. The best driving light beam is obtained when there is a high intensity near the top of the beam. This is accomplished by turning the adjusting screw, accessibly located at the rear of the lamp. When properly adjusted, the light will be intense at the top and shallow in height, as well as quite widespread. By loosening a single nut, which fastens the lamp to its bracket, the light beam may be adjusted in both vertical and horizontal directions.

When one lamp has been properly adjusted, it should be covered and the other lamp uncovered, then the necessary adjustments made to the latter. The lower beams of light will not require further adjustment.

Flickering lights indicate a loose connection, usually at the light sockets or the terminals at the switch. The fuses should be inspected to see that they are tight in the fuse clips.

Current Limit Relay

The current limit relay is used to protect the various car wiring circuits from damage due to overload or short circuits. The unit is located under the cowl on the rear side of the dash. When a load of 30 amperes or more is drawn, the relay trips and causes a buzzing sound in one of the elements of the unit and limits the current load to 10 amperes until the overload is eliminated.

The unit consists of two elements. The element on the left side protects the circuit to the lighting switch on the lower end of the steering gear. This furnishes protection for the circuits of the headlamp bulbs, tail lamp and instrument panel lamp. The element on the right side protects the circuits of the horns, signal light and body wiring (dome lights, etc.).

Battery

The battery is of a six-volt, three-cell type and is carried under the front floor board. When installing a battery, care must be taken to make certain that the positive terminal is grounded and that the negative terminal is connected to the starting and lighting cable before attempting to use any part of the electrical system. Damage may be done to the entire system if the wrong connections are made.

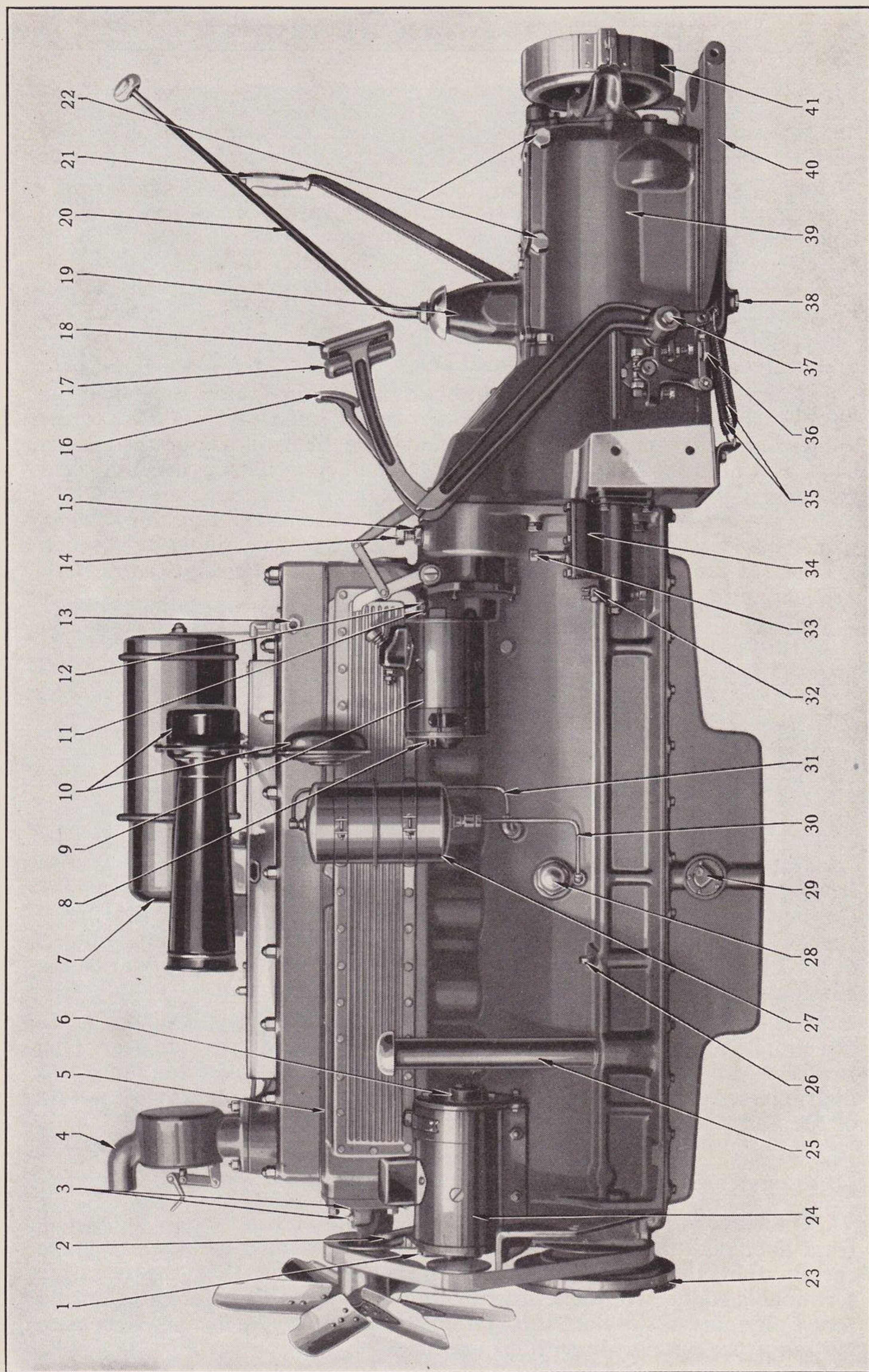


Fig. 17—Left Side View of Power Plant

The starter pedal should never be depressed for a period to exceed 15 to 30 seconds. Continual cranking of the engine by means of the starting motor will discharge the battery until it is no longer able to supply sufficient current to turn the engine. If the engine fails to start, the procedure on Page 75 should be followed. The clutch should be disengaged when starting the engine to reduce the load on the battery, especially during cold weather.

When storing the car for an extended period, the battery should be removed and delivered to a battery service station for attention during the period of car storage.

Care of Battery

The battery must be kept securely fastened in its rack. It should be cleaned and dried frequently. The terminals and connections should be coated with vaseline or grease. If the solution has been slopped or spilled, the surface of the battery should be wiped with a piece of waste, wet with ammonia.

If a sufficiently charged battery will not crank the engine it is probable that there is corrosion at the battery clamps and posts. In this case the clamps should be removed and all corrosion scraped from them, as well as the posts, to insure proper contact. The ground terminal and frame at the point of contact should also be scraped.

The electrolyte in the battery should always be maintained at the proper level and pure distilled water added to each cell of the battery until the solution is about $\frac{1}{2}$ " (12.7 mm.) above the top of the plates. If distilled water is not available, clean rain water will be satisfactory. If one cell regularly requires more water than the others, it is probably due to a leak and should be repaired at once. Acid or electrolyte should only be added to a battery by an experienced battery repairman. The filling hole plugs should be screwed in by hand.

The specific gravity of the solution in each cell should be tested occasionally with a hydrometer before adding water. If the reading is above 1.200 the battery is more than half charged. If it is below 1.200 but above 1.150, the battery is less than half charged, and is a warning to use the lights sparingly until the specific gravity is restored to at least 1.250. If there is no leak and one cell shows a specific gravity markedly lower than

Fig. 17—Left Side View of Power Plant

- | | |
|--|--|
| 1—Generator oil cup—front | 22—Transmission gearshift bar selector spring retainer |
| 2—Generator adjusting strap | 23—Crankshaft impulse neutralizer |
| 3—Water pump and fan shaft lubricant nipples | 24—Generator |
| 4—Cylinder water outlet elbow | 25—Oil filler breather pipe |
| 5—Engine serial number | 26—Oil level indicator rod |
| 6—Generator oil cup—rear | 27—Oil filter |
| 7—Intake muffler and air cleaner | 28—Oil pressure relief valve cap |
| 8—Starter motor oil cup—front | 29—Oil level gauge (engine unit) |
| 9—Starter motor | 30—Oil filter to engine tube |
| 10—Horns | 31—Engine to oil filter tube |
| 11—Starter motor oil cup—rear | 32—Signal lamp switch |
| 12—Starter motor grease hole plug | 33—Brake master cylinder reservoir cover tube |
| 13—Thermometer gland nut | 34—Brake master cylinder and reservoir |
| 14—Starter motor mounting screw | 35—Clutch and brake pedal pull-back springs |
| 15—Starter motor mounting screw lock nut | 36—Clutch release fork adjusting link yoke |
| 16—Starter pedal | 37—Clutch and brake pedal shaft |
| 17—Brake pedal | 38—Transmission drain plug |
| 18—Clutch pedal | 39—Transmission case |
| 19—Transmission gearshift housing | 40—Transmission case lower cover |
| 20—Transmission gearshift lever | 41—Transmission brake band |
| 21—Transmission brake hand lever | |

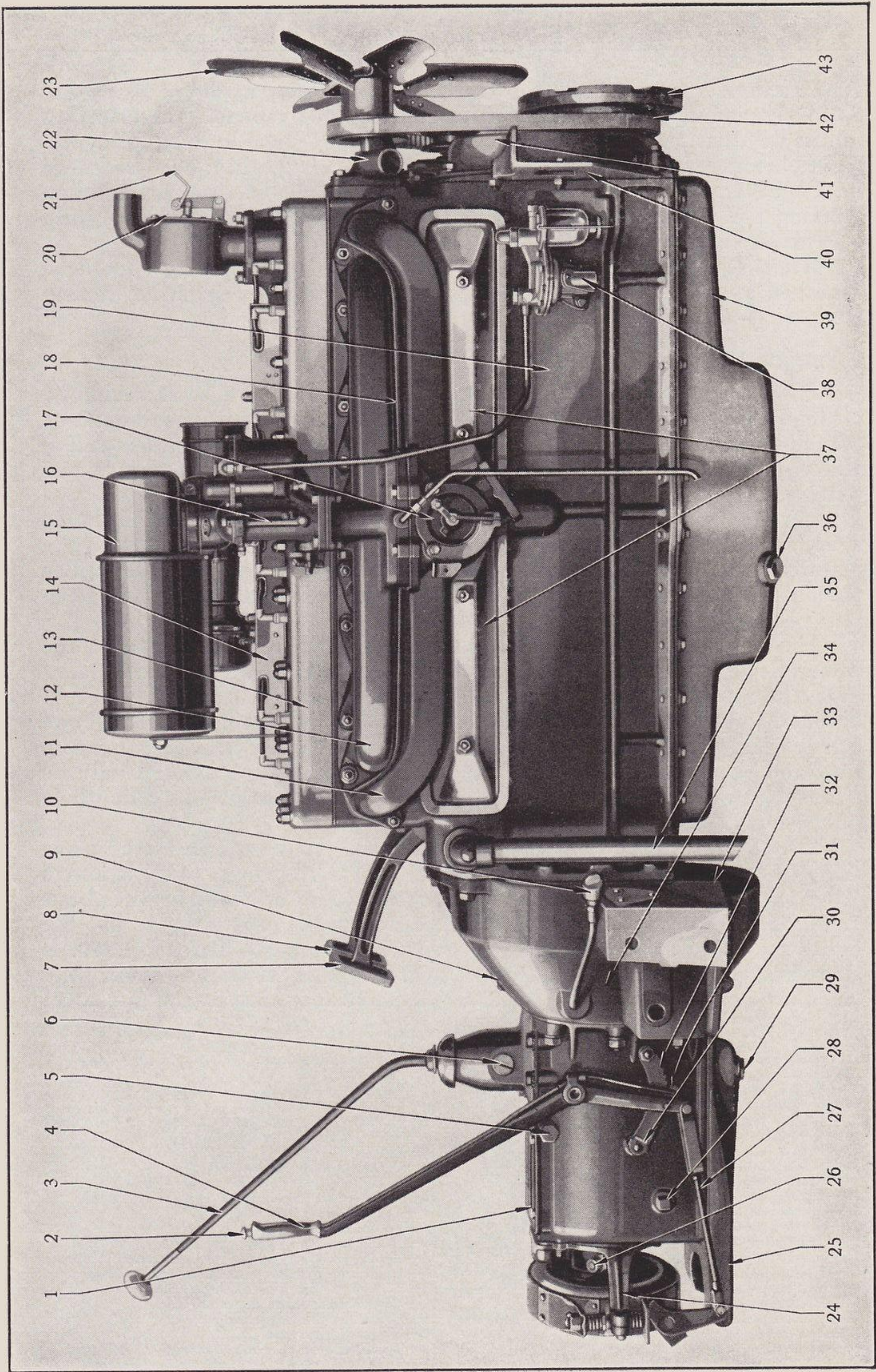


Fig. 18—Right Side View of Power Plant

the others, there is a short-circuit or some other trouble in that cell and it should have the prompt attention of a good battery repairman.

A fully charged battery will not freeze in temperatures ordinarily encountered. The electrolyte will freeze in a one-half discharged battery at about 20° below zero (−28° Centigrade) (specific gravity 1.210).

Horns

The horns are of the 6-volt high frequency vibrator type and are adjustable for tone by movement of the flat-headed screws on the covers in the rear end of each horn. The lock nuts must be tightened after adjustment has been completed. *None other than the standard horn supporting bracket should be used, and the horns should be mounted with the wire terminals pointing downward.*

Radio Equipment

Chrysler Imperial Eight closed cars are equipped with radio antenna and space for lead-in, and the necessary holes for supporting the receiving set.

Chrysler Imperial dealers are prepared to install radio receiving sets in Chrysler Imperial Eight closed cars.

When Chrysler Imperial Eight closed cars are shipped from the factory with radio receiving sets installed, the instructions for the operation and care of the sets will be found in the special radio instruction folder which is a part of the car equipment.

ENGINE

The power plant of the Chrysler Imperial Eight is of the unit type, having an eight-cylinder engine, of the L-head, four-cycle, poppet valve construction. The cylinder head and oil pan are removable.

Lubrication is accomplished by a full force feed system to all crankshaft, connecting rod, and camshaft bearings. The connecting rods have metering apertures drilled in their lower ends to spray the cylinder walls, piston pins, and the entire valve operating mechanism. An oil filter mounted on the engine passes the oil through treated fabric which re-

Fig. 18—Right Side View of Power Plant

- | | |
|---|---|
| 1—Transmission case upper cover | 22—Water pump |
| 2—Transmission brake hand lever release button | 23—Fan |
| 3—Transmission gearshift lever | 24—Transmission brake support |
| 4—Transmission brake hand lever | 25—Transmission case lower cover |
| 5—Transmission gearshift bar selector spring retainer | 26—Speedometer drive pinion |
| 6—Transmission gearshift housing heavy duty range stop plug | 27—Transmission brake pull rod |
| 7—Brake pedal | 28—Transmission case filler plug |
| 8—Clutch pedal | 29—Transmission case drain plug |
| 9—Clutch housing hand hole cover | 30—Transmission brake hand lever stop |
| 10—Clutch release bearing grease cup | 31—Transmission brake hand lever latch |
| 11—Exhaust manifold | 32—Transmission brake hand lever sector |
| 12—Intake manifold | 33—Clutch housing |
| 13—Cylinder head | 34—Clutch housing |
| 14—Ignition cable tube | 35—Crankcase ventilator outlet |
| 15—Intake muffler and air cleaner | 36—Oil pan drain plug |
| 16—Carburetor | 37—Valve spring covers |
| 17—Manifold heat control valve cover | 38—Fuel pump |
| 18—Manifold heat shield | 39—Oil pan |
| 19—Cylinder block and crankcase (integral) | 40—Chain case cover plate |
| 20—Thermostat | 41—Chain case cover |
| 21—Radiator shutter control linkage | 42—Fan, water pump and generator drive belt |
| | 43—Crankshaft impulse neutralizer |

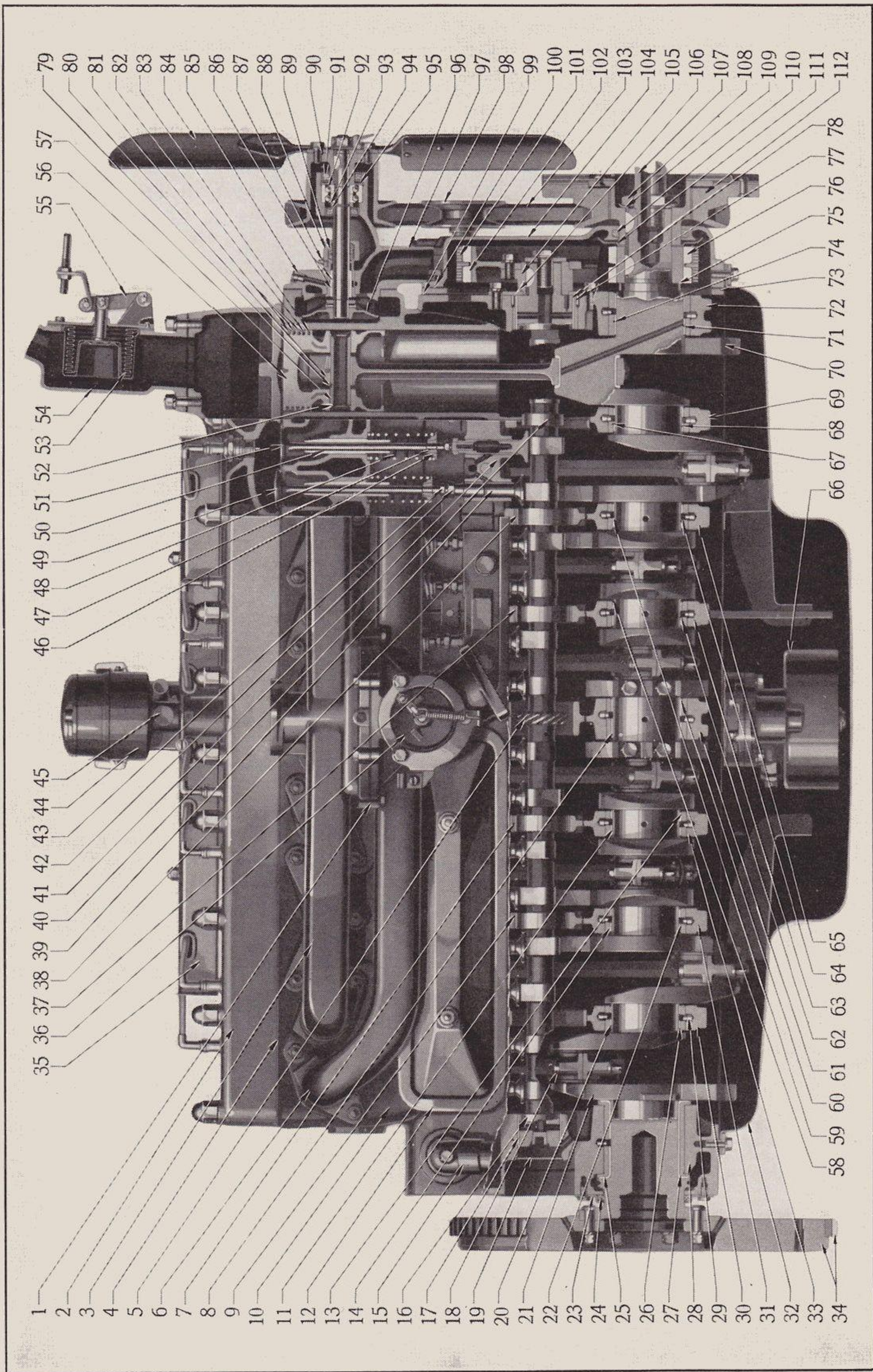


Fig. 19—Side Sectional View of Engine

moves dirt and sediment and returns the oil, cooled and cleansed, to the oil pan.

The water pump, in the front of the cylinder block, draws cool water from the bottom of the radiator and, through a system of graduated outlets and large passages, forces circulation around each cylinder and valve seat.

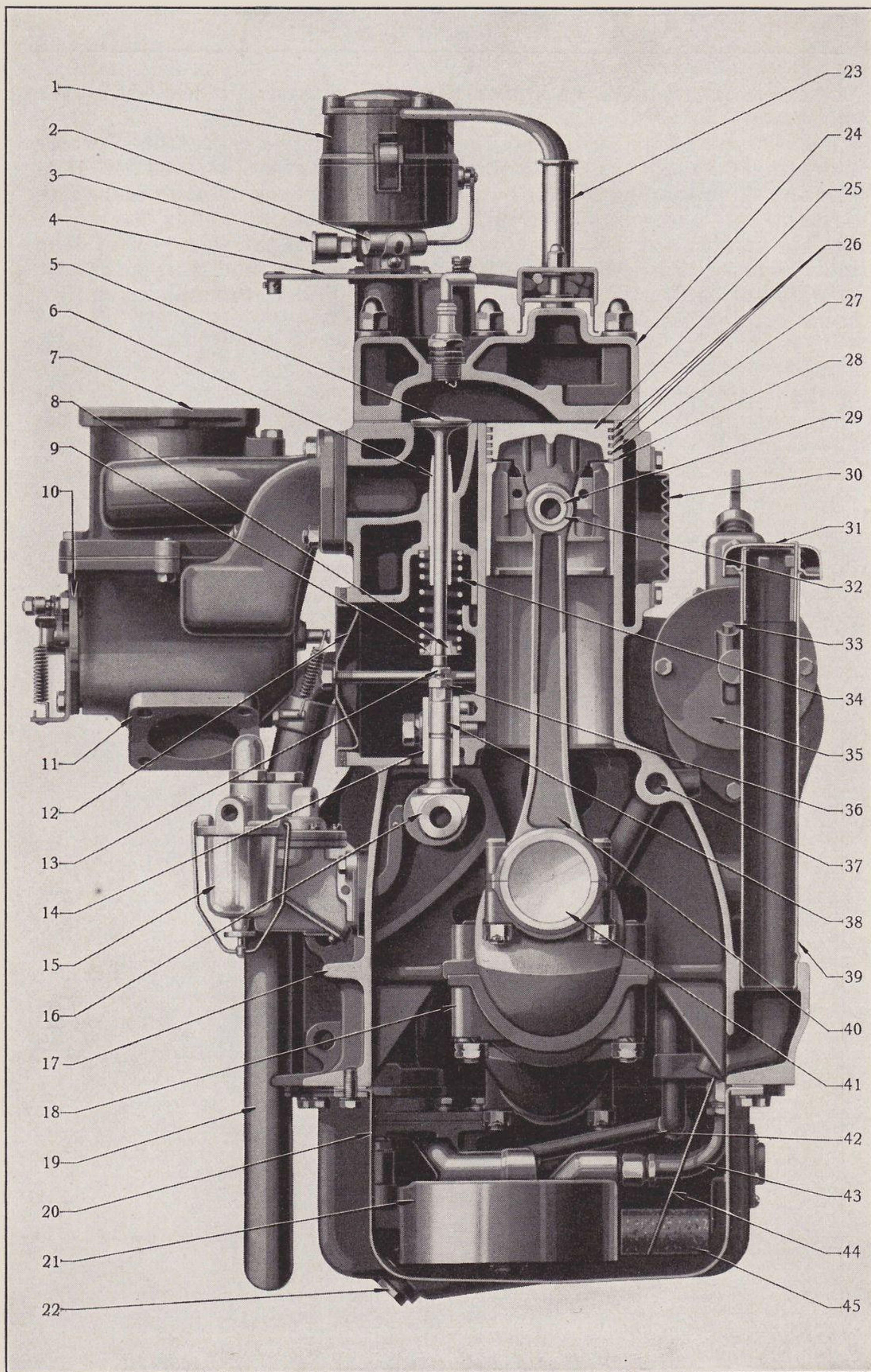
The camshaft is driven by the crankshaft through a silent chain. The ignition distributor, which has double breaker points and semi-automatic spark advance, is accessibly mounted on the cylinder head and driven by a spiral gear on the camshaft.

Pistons and Rings

Each piston is of light weight, of special slotted skirt design. The rings are all above the piston pin which floats free in the piston and in the connecting rod. Special tongue and groove compression rings are assem-

Fig. 19—Side Sectional View of Engine

- | | |
|--|--|
| 1—Intake to exhaust manifold gasket | 57—Piston pin |
| 2—Cylinder head | 58—Crankshaft bearing, upper—No. 4 |
| 3—Intake manifold | 59—Crankshaft bearing |
| 4—Cylinder head gasket | 60—Crankshaft bearing, lower—No. 5 |
| 5—Oil pump and distributor drive gear (integral with camshaft) | 61—Crankshaft bearing cap, No. 5 |
| 6—Exhaust manifold | 62—Crankshaft bearing, lower—No. 4 |
| 7—Camshaft bearing—No. 4 | 63—Crankshaft bearing cap, No. 4 |
| 8—Crankshaft bearing, upper—No. 5 | 64—Crankshaft bearing, lower—No. 3 |
| 9—Camshaft bearing—No. 5 | 65—Crankshaft bearing cap, No. 3 |
| 10—Cylinder block and crankcase (integral) | 66—Oil pump body |
| 11—Crankshaft bearing, upper—No. 6 | 67—Crankshaft bearing, upper—No. 2 |
| 12—Valve spring cover | 68—Crankshaft bearing, lower—No. 2 |
| 13—Crankshaft bearing, lower—No. 6 | 69—Crankshaft bearing cap, No. 2 |
| 14—Crankshaft bearing, upper—No. 7 | 70—Crankshaft (counterweight) |
| 15—Crankcase ventilator outlet | 71—Crankshaft bearing, lower—No. 1 (front) |
| 16—Camshaft | 72—Crankshaft bearing cap, No. 1 (front) |
| 17—Camshaft bearing—No. 6 | 73—Chain case cover plate |
| 18—Connecting rod cap bolt | 74—Crankshaft bearing, upper—No. 1 (front) |
| 19—Camshaft rear bearing plug | 75—Crankshaft sprocket shim |
| 20—Crankshaft bearing, upper—No. 8 | 76—Crankshaft sprocket |
| 21—Crankshaft | 77—Camshaft front bearing bushing dowel |
| 22—Crankshaft bearing, lower—No. 7 | 78—Camshaft front bearing bushing |
| 23—Crankshaft rear bearing oil retainer | 79—Connecting rod bushing |
| 24—Crankshaft rear bearing oil retainer seal | 80—Connecting rod |
| 25—Crankshaft bearing, upper—No. 9 (rear) | 81—Piston rings, upper—Nos. 1, 2 and 3 |
| 26—Crankshaft bearing, lower—No. 8 | 82—Piston ring, center—No. 4 |
| 27—Crankshaft bearing, lower—No. 9 (rear) | 83—Piston ring, lower—No. 5 |
| 28—Crankshaft bearing cap, No. 9 (rear) | 84—Fan blade |
| 29—Crankshaft bearing dowel | 85—Water pump shaft rear bushing oiler |
| 30—Crankshaft bearing cap, No. 8 | 86—Water pump shaft rear bushing and retainer |
| 31—Crankshaft bearing cap, No. 7 | 87—Fan bearing lubricant nipple |
| 32—Oil pan | 88—Water pump packing nut |
| 33—Crankshaft bearing cap, No. 6 | 89—Water pump packing |
| 34—Flywheel and ring gear | 90—Fan pulley |
| 35—Ignition cable tube | 91—Fan bearing front oil washer |
| 36—Manifold heat control valve cover | 92—Fan bearing |
| 37—Camshaft bearing—No. 3 | 93—Fan bearing collar |
| 38—Camshaft bearing—No. 2 | 94—Fan bearing rear oil washer |
| 39—Valve tappet | 95—Fan bearing retainer |
| 40—Fuel pump eccentric (integral with camshaft) | 96—Water pump impeller |
| 41—Valve tappet guide | 97—Water pump body |
| 42—Valve tappet adjusting screw lock nut | 98—Generator pulley |
| 43—Valve tappet adjusting screw | 99—Chain case cover plate gasket |
| 44—Distributor | 100—Chain case cover gasket |
| 45—Distributor grease cup | 101—Timing chain (drive chain) |
| 46—Valve spring retainer | 102—Camshaft sprocket |
| 47—Valve spring retainer lock | 103—Fan, water pump and generator drive belt |
| 48—Valve spring | 104—Chain case cover |
| 49—Exhaust valve | 105—Camshaft sprocket hub |
| 50—Valve stem guide | 106—Camshaft thrust plate |
| 51—Intake valve | 107—Crankshaft starting jaw |
| 52—Piston pin retaining ring | 108—Crankshaft impulse neutralizer nut |
| 53—Thermostat | 109—Crankshaft impulse neutralizer nut lock-washer |
| 54—Cylinder water outlet elbow | 110—Chain case cover oil seal cork |
| 55—Radiator shutter linkage (thermostat) | 111—Crankshaft oil throw disc |
| 56—Piston | 112—Crankshaft impulse neutralizer |



bled in the upper grooves of the piston. A special oil control ring is used in the bottom groove.

Pistons are fitted with .002" (.051 mm.) clearance at skirt, .019" to .022" (.482 to .559 mm.) clearance at the head. Piston pins are fitted with a tight thumb push in the connecting rod bushing at normal room temperature and a tight thumb push in the piston at boiling water temperature. This exact fit will allow proper lubrication at operating temperatures. When the pistons are being reassembled to an engine, the slot in the skirt should face toward the valve side of the engine.

All compression rings have a gap measure of .005" to .010" (.127 to .254 mm.). The oil control ring has a gap measure of .007" to .015" (.177 to .381 mm.). When assembling new parts the exact clearance must be allowed and the rings should move freely in the grooves when the piston is shaken. Piston and connecting rod assemblies should be removed from the top of the engine.

When connecting rod assemblies are being reassembled to an engine, the oil passages, through the big end bearing, should face toward the valve side of the engine.

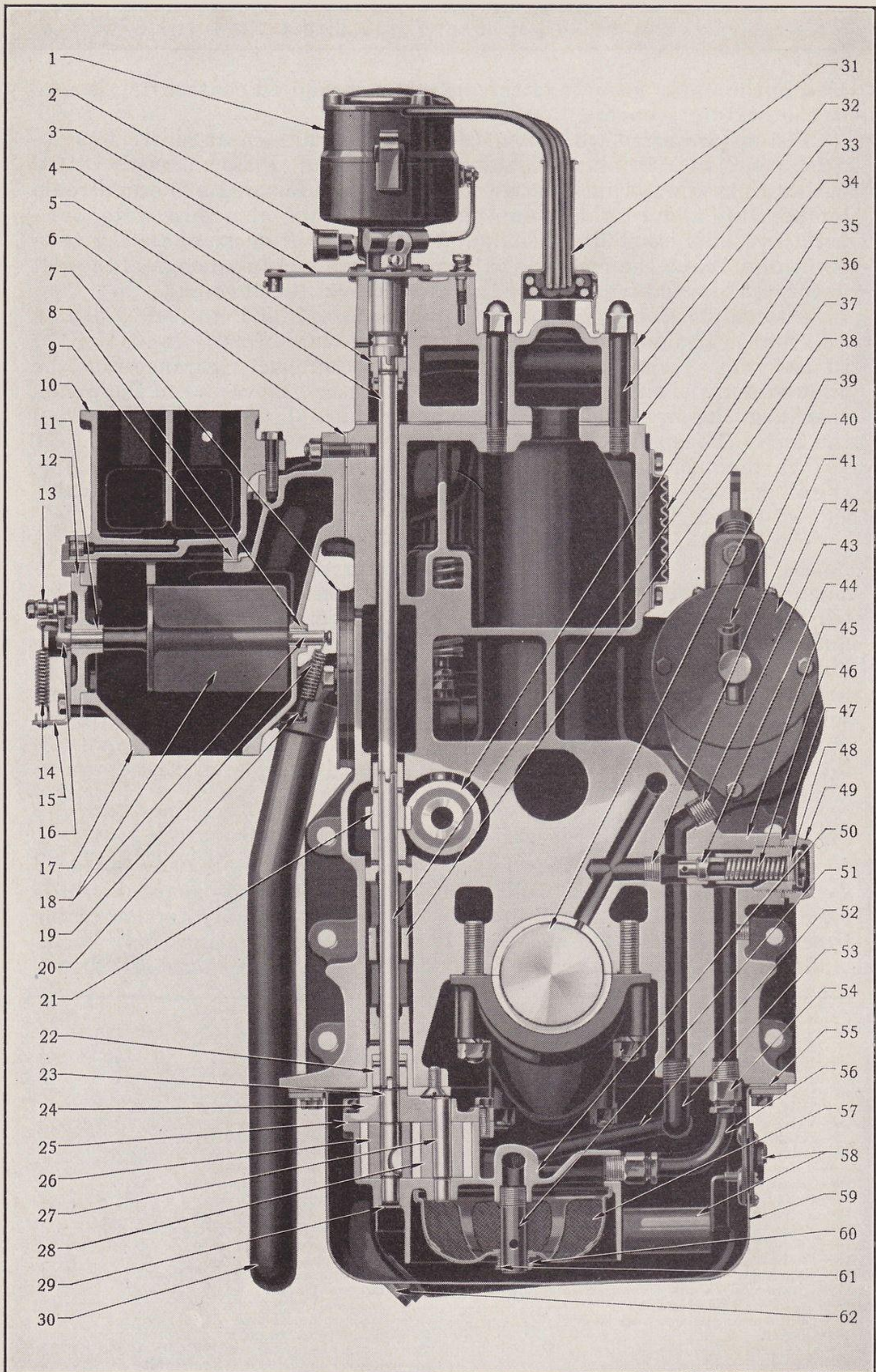
Chrysler Imperial Eight pistons and rings were selected only after exhaustive tests proved them most efficient for this engine. Under no consideration should so-called troubleproof pistons and rings be installed. Chrysler pistons and rings are the results of very elaborate, painstaking and expensive research. These parts can be obtained directly through authorized Chrysler Service Stations. If for any reason it should ever be necessary to replace one or more pistons, care should be exercised when selecting them so that the variation in weight is not more than $\frac{1}{4}$ of an ounce (.007 kgs.) in the entire set of eight pistons. If this limit is not followed, excessive vibration may result. Chrysler Imperial Eight owners should insist upon the use of genuine parts.

Bearings

The crankshaft is of the counterweighted design, positively balanced dynamically and statically, and mounted in nine bronze-backed, babbitt-lined bearings. The crankshaft main bearings are a special interchangeable type, manufactured to such close limits that new bearings may be installed without reaming, scraping, or burnishing. The camshaft, driven

Fig. 20—Front Sectional View of Engine

- | | |
|--|--|
| 1—Distributor | 24—Cylinder head |
| 2—Distributor condenser | 25—Piston |
| 3—Distributor grease cup | 26—Piston rings, upper—Nos. 1, 2 and 3 |
| 4—Distributor advance arm | 27—Piston ring, center—No. 4 |
| 5—Valve | 28—Piston ring, lower—No. 5 |
| 6—Valve stem guide | 29—Piston pin |
| 7—Intake manifold | 30—Cylinder water jacket cover |
| 8—Valve spring retainer lock | 31—Oil filler breather cap |
| 9—Valve spring retainer | 32—Connecting rod bushing |
| 10—Manifold heat control valve cover | 33—Starter motor oil cup—front |
| 11—Exhaust manifold | 34—Valve spring |
| 12—Valve spring cover | 35—Starter motor |
| 13—Valve tappet adjusting screw | 36—Valve tappet adjusting screw lock nut |
| 14—Valve tappet guide | 37—Oil passage |
| 15—Fuel pump | 38—Valve tappet |
| 16—Camshaft | 39—Oil filler breather pipe |
| 17—Cylinder block and crankcase (integral) | 40—Connecting rod |
| 18—Crankshaft bearing cap | 41—Crankshaft |
| 19—Crankcase ventilator outlet | 42—Oil pump outlet pipe |
| 20—Oil pan | 43—Oil pump return pipe |
| 21—Oil pump | 44—Oil level indicator rod |
| 22—Oil pan drain plug | 45—Oil level gauge float (engine unit) |
| 23—Ignition cable tube | |



by the crankshaft through a silent chain, is mounted in six large steel-backed, babbitt-lined bearings.

The connecting rods are manufactured to exact size and are interchangeable without fitting, having bearings of babbitt, cast integrally by a centrifugal process, thereby providing a perfect bond and a bearing free from flaw or foreign substance.

Due to the full force feed oiling system, all engine bearings are assembled with a clearance of .002" (.051 mm.) so that there is always a film of oil under pressure as a cushion between the bearings and shaft.

Damaged bearings are positively and quickly repaired at small cost by installing new bearings, which restore the original factory alignment. Bearings are otherwise not adjustable. These bearings should not be tampered with in any way other than to replace them. *A bearing cap should never be filed.*

Valves and Valve Timing

Extra large valves are mounted along the right side of the cylinder block and are lifted by adjustable tappets of the mushroom type. The inlet valves are of chrome-nickel steel. The exhaust valves are of "CNS" steel, the ultimate in heat-resisting metals. Valve stems operate in cast iron guides, generously lubricated. The valve tappets are mounted in groups of four in cast iron brackets, easily removed.

To Set Valve Timing

The crankshaft should be turned until Nos. 1 and 8 pistons are at top dead center. The $\frac{1}{8}$ " (3.18 mm.) pipe plug should be removed from the cylinder head above No. 8 piston and a gauge rod placed through this hole and in contact with the piston head. Care must be taken to make certain that the gauge rod rests on the piston and not on an accumulation of carbon. This provides an easy means of determining the position of Nos. 1 and 8 pistons. When these pistons are at top dead center the tim-

Fig. 21—Center Sectional View of Engine

- | | |
|---|--|
| 1—Distributor | 32—Cylinder head |
| 2—Distributor grease cup | 33—Cylinder head stud |
| 3—Distributor advance arm | 34—Cylinder head gasket |
| 4—Distributor drive shaft coupling | 35—Oil pump and distributor drive gear and camshaft (integral) |
| 5—Distributor drive shaft | 36—Cylinder water jacket cover |
| 6—Exhaust manifold center gasket | 37—Oil pump drive shaft—upper |
| 7—Valve spring cover | 38—Oil pump upper drive shaft support |
| 8—Manifold heat control valve shaft bushing | 39—Crankshaft |
| 9—Intake to exhaust manifold gasket | 40—Starter motor oil cup—front |
| 10—Intake manifold | 41—Oil hole |
| 11—Manifold heat control valve shaft bushings | 42—Starter motor |
| 12—Manifold heat control valve cover | 43—Oil hole plug—large |
| 13—Manifold heat control valve swivel clamp | 44—Oil pressure relief valve plunger |
| 14—Manifold heat control valve lever spring | 45—Crankcase and cylinder block (integral) |
| 15—Manifold heat control valve lever spring bracket | 46—Oil pressure relief valve spring |
| 16—Manifold heat control valve lever and swivel | 47—Oil pressure relief valve cap gasket |
| 17—Exhaust manifold | 48—Oil pressure relief valve spring retainer |
| 18—Manifold heat control valve and shaft | 49—Oil pressure relief valve cap |
| 19—Manifold heat control valve spring | 50—Oil pump body |
| 20—Manifold heat control valve spring stud | 51—Oil pump suction pipe |
| 21—Oil pump and distributor drive gear | 52—Oil pump outlet pipe |
| 22—Oil pump drive shaft collar | 53—Oil pump outlet pipe elbow |
| 23—Oil pump drive shaft—lower | 54—Oil pump return pipe nipple |
| 24—Oil pump cover | 55—Oil pan gasket |
| 25—Oil pump cover gasket | 56—Oil pump return pipe |
| 26—Oil pump drive gear | 57—Oil strainer screen |
| 27—Oil pump idler gear shaft | 58—Oil level gauge and float (engine unit) |
| 28—Oil pump idler gear | 59—Oil pan |
| 29—Oil pump body drive shaft hole plug | 60—Oil strainer spring |
| 30—Crankcase ventilator outlet | 61—Oil strainer spring retainer |
| 31—Ignition cable tube | 62—Oil pan drain plug |

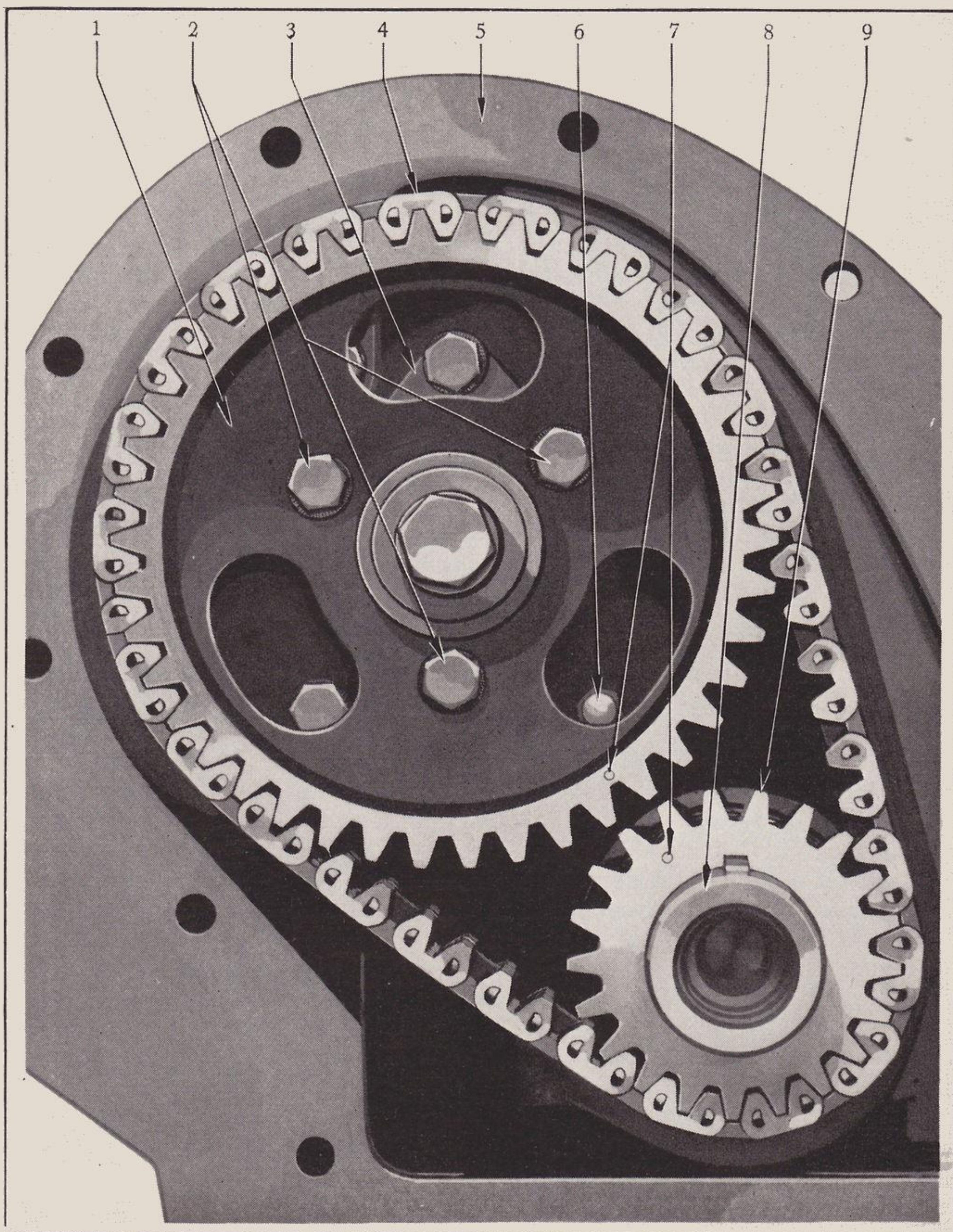


Fig. 22—Timing Chain and Sprockets

- 1—Camshaft sprocket
- 2—Camshaft sprocket screws
- 3—Camshaft thrust plate
- 4—Drive (timing) chain
- 5—Chain case cover plate

- 6—Drive chain oiler
- 7—Timing marks
- 8—Crankshaft
- 9—Crankshaft sprocket

ing marks on the crankshaft and camshaft sprockets should be opposite each other (Fig. 22) and checked with a straightedge to see that they are straight in line between the crankshaft and camshaft centers.

To Check Valve Timing

The $\frac{1}{8}$ " (3.18 mm.) pipe plug should be removed from the cylinder head above No. 8 piston and a gauge rod placed through this hole and in contact with the piston head. The valve tappets should next be adjusted while the engine is cold with .008" (.203 mm.) clearance for the intake and .009" (.228 mm.) for the exhaust. This clearance is necessary when checking the valve timing but should be changed to .007" (.179 mm.) for the exhaust and .005" (.127 mm.) for the intake when the engine is warm and as soon as the checking is completed because the latter is the proper setting for quiet valve operation. The crankshaft should be rotated until No. 8 piston is coming up on compression stroke and stopped when the piston is .017" (.431 mm.) past top dead center. The No. 1 intake valve tappet should be up just enough to be tight and the valve just about to open. No. 1 cylinder exhaust valve closes two degrees of crankshaft rotation later or with the piston .030" (.762 mm.) past top dead center. The exhaust valves are Nos. 1-4-5-8-9-12-13-16.

Valve Grinding

There are a few precautions which should be observed when grinding the valves. Remove the thermometer connection at the cylinder head before attempting to remove the head. Do not compress the valve springs to a length of less than $2\frac{1}{8}$ " (54.00 mm.) as there is a possibility of them taking a permanent set, which would result in valve spring flutter and poor performance at high speeds. The valves are of alloy steel, so hard that they are little affected by valve grinding compound. To save excessive grinding away of the seats, the valves should first be ground in a valve refacing grinder. The valves may then be lapped in with compound to produce a gas-tight seat. Immediately on finishing grinding a valve the valve seat and valve stem should be very carefully cleaned and lubricated.

Timing Chain

In the event that it should become necessary, for any reason, to remove the timing chain, this is very readily accomplished, after removing the chain case cover, by removing the three bolts holding the camshaft sprocket to its hub on the front end of the camshaft. The sprocket and chain may then be lifted off. The camshaft sprocket hub, which is keyed to the camshaft, may then be removed from the shaft if necessary.

When replacing the timing chain it should be assembled to the sprockets and the camshaft sprocket bolted to its hub after the hub is in place on the front end of the camshaft. Care must be taken to see that the timing marks on the camshaft and crankshaft sprockets line up as described under "To Set Valve Timing" (Page 55). The bolt holes in the camshaft sprocket and its hub are so placed that the sprocket can be put on in only one position.

The timing should be carefully checked after performing any operation on the timing chain. (Page 42 and as described above).

Repairs or adjustments to the timing chain should be entrusted to Chrysler Service Stations, as a variation of only one tooth on the sprocket will make a marked difference in the operation of the car.

ENGINE LUBRICATION

Proper lubrication is of vital importance. Lubricating with the best materials and with the utmost care will be repaid many times by long wear and good service.

This is a matter of vital importance and considerable care should be taken when selecting engine oil to make certain that it is of the highest quality.

Oil is put into the engine through the oil filler located on the left hand side of the crankcase. The oil level indicator is toward the rear of the engine from the oil filler. When a reading of this indicator is being taken, the engine should be stopped, the indicator removed and the oil wiped off the indicator rod. The indicator should then be inserted again and removed for a true reading. The engine should never be operated when the oil is below the lower mark of the indicator rod. The crankcase capacity is $8\frac{1}{2}$ quarts (8.05 liters).

In addition to the level indicator, the gasoline gauge will show the level of the oil when the push-button located on the right hand edge of the instrument panel, is pressed. (Page 61, Fuel Gauge and Oil Gauge.)

For correct engine lubrication a high-grade, well-refined oil is essential. As a guide to the proper viscosity or body of oil for summer and winter conditions, which vary for different territories, the lubrication charts of the reputable oil companies should be consulted. In general an oil having the body of S. A. E. viscosity number 30 is recommended for summer use. For extreme warm weather conditions or for especially high speed, S. A. E. viscosity number 40 may be advisable.

For winter use, the oil to be used will depend on whether the car is kept in a heated garage or not, or, in other words, whether crankcase temperatures ever fall as low as the temperatures of the outside air. The two factors determining the choice of a winter lubricant are:

1. The viscosity or body of the oil at time of starting must be sufficiently low to permit the needed cranking speed.
2. The cold test should not be above the crankcase temperature.

With these two basic requirements, the winter lubrication recommendations are:

For cars kept in heated garages; at outside air temperatures below freezing and above zero, use an oil having the body of S. A. E. viscosity number 30 with low cold test. At temperatures consistently below zero, an oil having the body of S. A. E. viscosity number 20 with low cold test is recommended.

For cars kept in heated garages, but that are allowed to stand outside for a sufficient time for crankcase temperatures to reach that of outside air: The recommendations given for cars kept in unheated garages are to be followed.

For cars kept in unheated garages in winter at temperatures below freezing, use an oil having a body of S. A. E. viscosity number 20 and with a low cold test. For temperatures consistently below zero, an oil having the body of S. A. E. viscosity number 10 with a low cold test, or S. A. E. viscosity number 20 with a low cold test diluted with 5% ($\frac{1}{2}$ pint) (.24 l) kerosene is to be used. This kerosene and oil should be thoroughly mixed.

These light, low pour test oils which are recommended for winter use are for meeting the requirements for starting when cold, and for insuring circulation. It is important to note that the body of these oils would be considered too light under high speed conditions resulting in excessively high crankcase temperatures.

IMPORTANT: S. A. E. viscosity numbers constitute a classification of crankcase lubricating oils in terms of viscosity or body only. Other factors of oil quality or character are not considered in this numbering system. Be sure that the oil used is of high quality and a well refined product.

The gear type oil pump draws the oil through a strainer and forces it through passages drilled in the cylinder block to the main bearings and camshaft front bearing and from the main bearings through passages in the crankshaft to the connecting rod bearings and also through the hollow camshaft to its bearings. The spray off the bearings and the streams of oil from oil holes in the connecting rods lubricate all other reciprocating and rotating parts of the engine. A tube from the front camshaft bearing delivers oil direct to the timing chain and sprockets.

An oil filter is mounted on the engine which passes the oil through treated fabric, removing carbon and dirt too small to be caught by the strainer.

Oil Pressures

The oil pressure gauge, on the instrument board, at normal driving speeds with warm engine and oil will show approximately 30 to 40 lbs. pressure. Greater pressure compresses a spring in the oil pressure relief valve, allowing excess oil to pass back into the engine oil pump sump.

The oil gauge should be watched at all times, particularly in winter. If at any time it should indicate no pressure, the engine should be stopped immediately. If there is plenty of oil in the pan, the oiling system should be carefully checked by a competent mechanic before starting.

The oil pressure relief valve may be adjusted to increase or decrease pressure on the gauge, but it should not be touched until the oiling system has been carefully checked by an experienced mechanic. If the gauge shows inadequate or too great pressure, it indicates trouble in the oiling system. Changing the position of relief valve to correct gauge reading removes the effect of the trouble, but does not remove the cause. If it becomes necessary to adjust the oil pressure relief valve, the cap nut adjacent to the oil filler should be removed and the locking wire withdrawn. The slotted plug should be turned clockwise to increase the pressure or anti-clockwise to decrease the pressure.

There are several conditions which may cause a reduction in the pressure registered on the gauge. They should always be carefully checked before any change is made in the adjustment of the pressure relief valve. Some of them are as follows:

Use of an oil with too heavy a body or with too high a cold or pour test at zero temperature or below; oil excessively thinned out by unvaporized and unburned fuel; loose bearings, the looseness may be due to wear and should be investigated; a leaky or broken oil tube; clogged oil screen; broken oil gauge.

Oil Filter

The engine oil filter on the left side of the engine separates foreign

substances from the engine oil, but it is not intended to separate fuel and acids which form in the engine oil due to natural service and improper use of the carburetor choke. When the engine is running fast enough to register about 10 lbs. pressure on the oil pressure gauge the return connection on the oil filter should be removed if it is desired to determine whether or not the oil is passing through the filter. A steady flow of clean oil should then be observed passing through the bottom of the filter. If a steady flow of oil cannot be observed at this point, the filter may have become clogged with foreign matter. In this case the filtering cartridge should be replaced. However, under normal conditions it should not be necessary to replace this filtering unit more frequently than 8000 to 10,000 miles (12,800 to 16,000 km.) of car travel.

Draining Crankcase Oil

Due to natural conditions, the engine oil, in use, is constantly being impregnated with fuel, water, and acid, depreciating the value of the oil as a lubricant. For this reason the oil should be replaced at regular intervals. (See Lubrication Chart—Center Insert.) Running the engine with the choke closed or partially closed increases the amount of fuel drawn into the cylinders. To reduce the amount of fuel which will work into the engine oil, the engine should be run with choke button pushed in as far as possible. The rapidity of accumulation of these damaging elements can be governed to a great extent by the driver of the car.

Fuel accumulates in the engine oil because of a certain excess of fuel in the combustion chambers not burning and working down the cylinder walls into the crankcase. Only certain percentages of vaporized fuel and air when mixed will ignite and explode in the combustion chamber. If the mixture contains too much fuel the excess will not burn, but a certain amount of it will remain on the cylinder walls and work down into the crankcase by the action of the pistons.

Water vapor is a product of combustion. There is approximately as much water vapor formed by weight as fuel consumed. This accounts for the white vapors and water coming from the exhaust which is most noticeable in cold weather. A certain amount of this vapor condenses on the cylinder walls and is carried into the crankcase by action of the pistons. This water accumulates in the crankcase and under certain conditions forms an oil sludge. An excess of sludge or water may interfere with lubrication.

Acid forms in the combustion chamber also due to natural causes. Fuel contains varying percentages of sulphur which, when burned, changes to sulphur dioxide. The sulphur dioxide unites with water in the combustion chamber, making sulphurous acid.

The accumulation of these non-lubricating elements in the engine oil has very damaging effects on the wearing surfaces. Fuel thins the oil, reducing its lubricating ability. Water is a non-lubricant and is liable to freeze, causing stoppage of the oil circulation. The sulphurous acid attacks bearing surfaces and causes excessive wear. The rapidity of accumulation of these elements increases as the temperature decreases. The crankcase ventilator (Page 64) greatly reduces the formation of these elements which, in turn, reduces dilution of the crankcase oil. These

elements can only be removed by draining the crankcase and the following instructions should be observed carefully:

To drain the oil, the drain plug in the bottom of the oil pan should be removed. The best time to drain is after a run when the engine is heated. The oil is thinner when it is hot and is also thoroughly mixed. It will, therefore, carry off sediment more completely.

Kerosene should never be used for flushing out the oil pan and lubricating system. A certain amount will remain in the system, collecting in pockets from which it cannot readily be drained and will dilute the oil.

Cleaning Oil Pan and Screen

At least once a year, preferably in the fall, the oil pan should be removed from the engine and thoroughly washed. The oil strainer should be removed and washed at this time.

FUEL SYSTEM

Fuel Tank

The fuel tank, carried at the rear of the frame, has a capacity of $21\frac{1}{2}$ U. S. S. gallons (17.91 Imperial gallons, 81.38 liters). The vent in the filler cap must be kept open at all times to permit action of the fuel pump. Once a year draw the tank, by removing the drain plug in the sediment boss on the bottom, to remove any accumulation of water and dirt.

Fuel Gauge and Oil Gauge

The electrically operated gauge "GAS-OIL" on the instrument panel is connected to the ignition switch, so that it will show the level of the fuel in the main tank at all times when not reading the oil level. This gauge also reads the level of the oil in the engine oil pan whenever the push button, located on the lower right edge of the instrument panel (No. 32, Fig. 1) is depressed. An oil level indicator is also located on the left side of the engine (Page 58). The connections at the fuel tank, ignition coil, fuel gauge and oil pan should be kept tight.

Fuel Pump

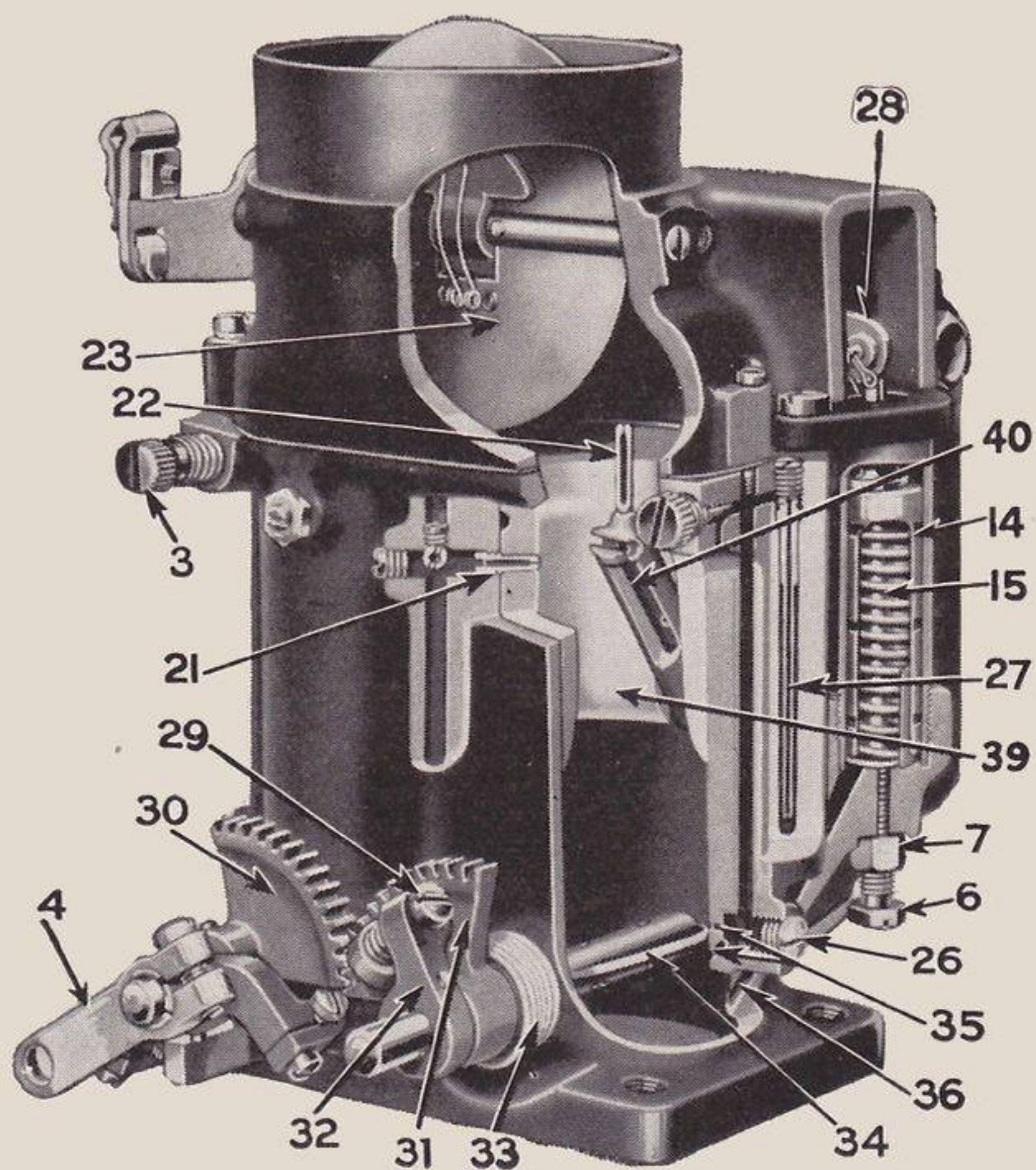
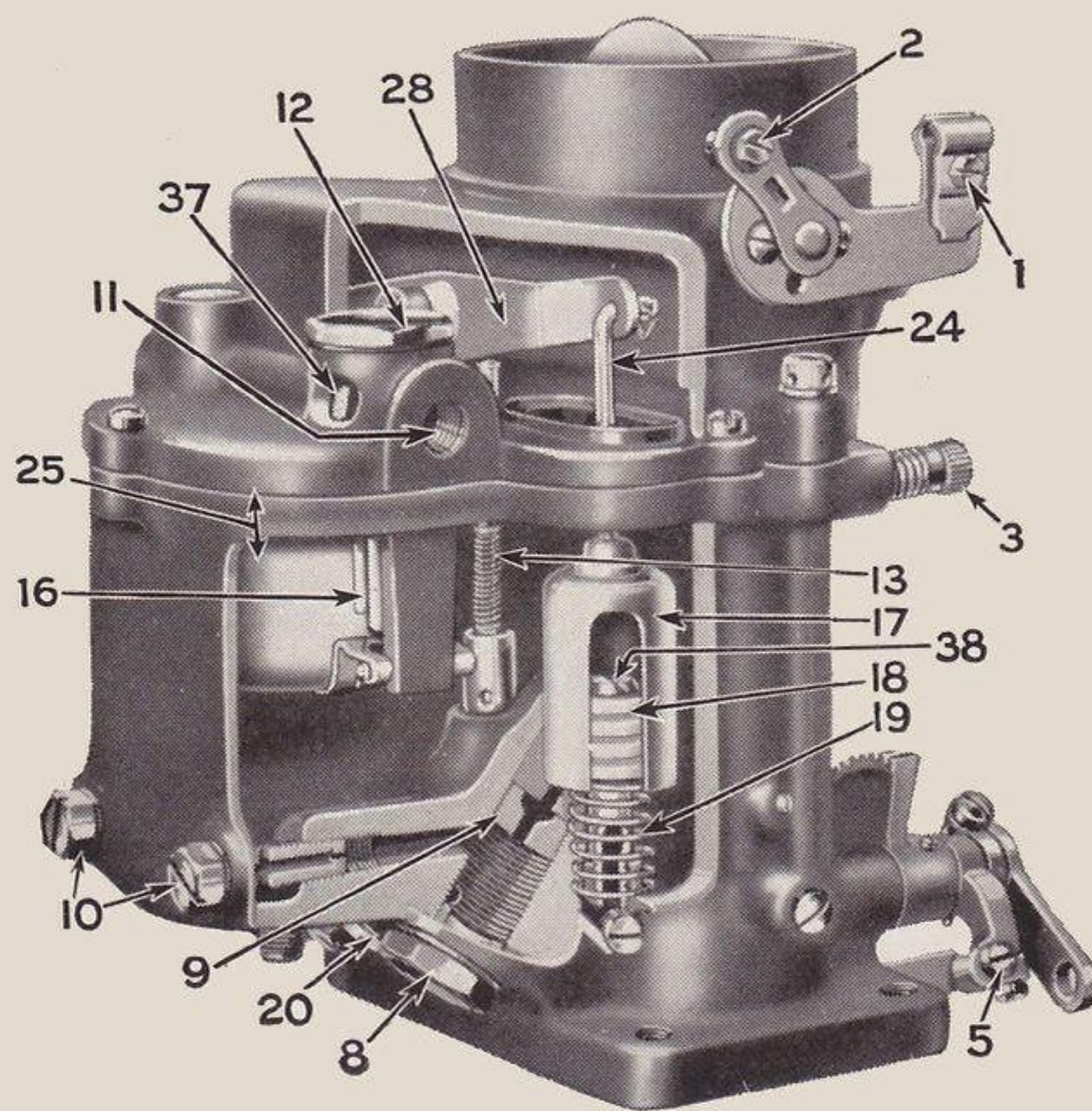
The fuel pump is mounted on the right side of the engine and is driven by an eccentric on the camshaft. It draws the fuel from the tank and forces it to the carburetor. It is automatic in its action, the fuel being delivered according to the requirements of the carburetor. The mounting bolts and the fuel connections of the fuel pump should be kept tight. Lubrication is not required.

Fuel Filter

The fuel filter consists of a strainer and sediment bowl, built as part of the fuel pump. Every three months, or oftener, if needed, remove and clean the strainer and bowl. When replacing the bowl see that its gasket is not broken, that it is in the proper place and the bowl is securely tightened.

Carburetor

The carburetor is of the plain tube dual down-draft type; all orifices are fixed. The mixture of the operating range is determined by the diameter of the main metering screws (10, Fig. 23). If due to unusual



weather or atmospheric conditions a richer or leaner mixture is necessary, metering screws having the passage of proper size can be obtained at a Chrysler Service Station.

The idling mixture and closed throttle running are controlled by the idle adjusting screws (3). These operate on the air so that by turning them clockwise results in a richer mixture. Screw the inner idle adjusting screw (3), (the one toward the engine) all the way into its seat and then screw it out until the steadiest and fastest running for that throttle position is obtained. This adjusts the mixture to the four cylinders that are fed by the inner carburetor barrel. Adjust the outer idle adjusting screw (3) so that its four cylinders fire smoothly. It may be necessary to recheck the inner idle adjusting screw (3), cutting it down slightly. Both idle adjustments should, preferably, be on the rich side.

If, after completing the idle adjustments, the engine idles too fast or too slow, adjust the throttle stop screw (5). By turning the screw (5) clockwise the engine speed is increased and turning it anti-clockwise the speed is decreased. The stop screw (5) should be adjusted to the best minimum idling speed.

Twin carburetors will idle the engine on a very small throttle opening, therefore it is necessary that the two throttle valves be accurately synchronized so they will open together and pass the same amount of air while the engine is idling. If after the throttle stop screw (5) has been set for correct idling speed, they idle erratically, the screw (29) may be used to synchronize the throttles to uniform opening.

Turning the screw (29) clockwise opens the throttle in the left barrel of the carburetor, and turning it counter-clockwise closes it without disturbing the position of the throttle valve in the other barrel. The engine should idle evenly when both throttles are synchronized.

The mixture from the accelerating pump (18) is adjustable and should be changed for winter and summer. In the winter a greater discharge from the pump is desirable; this can be altered by loosening the lock nut (7) and screwing up clockwise on the screw (6). Turning this screw "up" or clockwise cuts down the accelerator pump charge, and is the summer adjustment. Turning it down or anti-clockwise on the screw (6) is the winter adjustment. Be sure to tighten the lock nut (7) after adjusting.

CAUTION: With choke on the instrument panel pushed "in", the choke butterfly valve should be inspected to see that it is wide open. It

Fig. 23—Carburetor

- | | |
|--------------------------------------|---------------------------------|
| 1—Choke control tube clamp screw | 21—Pump discharge nozzle |
| 2—Choke lever wire clamp screw | 22—High speed air bleeder |
| 3—Idling needle valve | 23—Choke valve |
| 4—Throttle lever | 24—Pump piston link |
| 5—Throttle stop set screw | 25—Float setting |
| 6—Pump adjustment screw | 26—Idle discharge plug |
| 7—Pump adjustment screw lock nut | 27—Idle tube |
| 8—Main discharge nut | 28—Pump lever |
| 9—Main discharge jet retainer plug | 29—Throttle synchronizing screw |
| 10—Main metering jet | 30—Throttle gear (right) |
| 11—Fuel connection | 31—Throttle gear (left) |
| 12—Strainer plug | 32—Throttle synchronizing lever |
| 13—Economizer needle valve | 33—Throttle return spring |
| 14—Vacuum piston | 34—Throttle valve |
| 15—Vacuum piston spring | 35—Idling discharge holes |
| 16—Float needle valve and seat | 36—Economizer suction hole |
| 17—Pump piston sleeve | 37—Gasoline strainer |
| 18—Pump piston | 38—Pump stud |
| 19—Pump piston spring | 39—Venturi tube |
| 20—By-pass metering jet (economizer) | 40—Main discharge jet |

should also be inspected to see that it closes tightly when the choke button is pulled "out" for starting purposes, because, if the choke is open but slightly, starting may be difficult. The choke operating wire is held in place by the screw "2". For cold weather starting and operation of the choke, see directions under heading "To Start Engine" on Page 11.

Cleaning

To clean the carburetor remove strainer plug (12) and remove strainer. Main metering jets (10) may also be removed for cleaning. If an accumulation of solid particles is found in the strainer a thorough cleaning of the fuel passages should be made by removing the metering jets Nos. 10 and 20 and the main discharge nuts (8). These jets can be easily cleaned by blowing through them.

Air Cleaner

The air drawn into the carburetor contains a certain amount of dust which is an abrasive, and if allowed to enter the cylinders will cause more rapid wear of the pistons, rings and cylinders, and it gradually works into the oil pan and is circulated through the engine. It is true that the oil filter on the engine will remove this foreign substance from the oil, but the air cleaner (Fig. 18) removes the dust from the air before it enters the carburetor.

The air cleaner, which is part of the intake muffler, is of wire mesh construction, and should be cleaned periodically, depending on the conditions under which the car is operating. To clean the air cleaner the intake muffler should be removed from the carburetor and slushed in gasoline to remove all dirt. The air cleaner end should then be dipped in used crankcase oil and allowed to drain.

The oil should not be wiped off, as this will impair the efficiency of the cleaner.

Crankcase Ventilation

Due to natural operating conditions of a gasoline engine, gasoline and water vapors form in the crankcase, which, under certain conditions, may cause an etching of the brightly finished steel bearing surfaces in the engine and dilution of the crankcase oil. These gases are expelled (before condensing) from the crankcase through the ventilator pipe connected to the upper right side of the crankcase between the cylinder block and the flywheel housing.

The forward motion of the car causes a vacuum at the outlet end of the ventilator pipe (below at the side of the engine) which draws the gases from the crankcase. The fresh air vent in the front end of the crankcase is through the oil filler pipe on the left side of the crankcase. This causes a complete ventilation or exhausting of crankcase gases.

The oil filler is provided with vanes, which start the ingoing air whirling so as to prevent dust entering the crankcase with the ventilating air.

The air cleaning shutter should be closed only when driving in a very abnormal dusty condition of roads. The shutter is closed when the lug is at the extreme left end of the slot in the top of the oil filler cap. This can only be seen when the cap of the oil filler is in the inverted position.

Manifold Heat Control

Manifold heat control provides a quick means of heating the inlet manifold, thereby reducing the length of time that the choke must be used after starting a cold engine. It also makes the engine more flexible during the warming-up period, as well as reducing fuel consumption, carbon accumulation, and crankcase dilution.

The valve for this heater is operated by a button on the instrument panel. Pulling this button out closes the main exhaust passage and opens a manifold by-pass, thereby causing all of the exhaust gas to circulate through the inlet manifold heat jacket before going to the muffler. Pushing the button "in" closes the by-pass and opens the exhaust passage direct to the muffler, under which condition the inlet manifold is heated by the exhaust gas principally from the two center cylinders.

When starting and warming up a cold or cool engine, the manifold heat control button should be pulled "out" to its stop. After the engine is sufficiently warm to provide standard performance with the carburetor choke button pushed "in", the heat control button should be pushed "in" to its stop.

Primarily, the manifold heat control is designed for cold weather usage. In freezing weather, full heat can be used to good advantage for city driving. For cross-country driving at high speeds, even in freezing weather, the manifold heat control button should be pushed in all the way; manifold heat "on" under these conditions would cause a loss of power and efficiency.

CAUTION: The manifold heat control wire should be inspected at the point where it attaches to the valve control lever at the manifold to see that it is not bent or kinked.

IMPORTANT—THE ENGINE SHOULD NOT BE RACED OR WORKED HARD UNTIL IT IS WARMED UP AND RUNNING SMOOTHLY, AND WITH THE CARBURETOR CHOKE BUTTON PUSHED "IN".

SPRINGS

The chassis springs are semi-elliptic and mounted on rubber supports at each end, requiring no attention.

Spring breakage at or near the center is caused, in practically every instance, by loose spring clips (holding the springs to the axles), which throw the entire stress on the center tie bolts. They should be tightened at least three times during the first month and about once every month for the succeeding six months.

Spring Shackles

The spring shackles used on the Chrysler Imperial Eight are constructed of a rubber ring, held under pressure between two steel sleeves. They require no attention whatsoever, other than seeing that the shackle lock bolts are kept tight.

CAUTION: Since rubber is a contributing factor to the smooth, economical operation of the spring shackles, care must be exercised to see that no grease, oil or gasoline is allowed to get on the shackles, since it would deteriorate the rubber and thus destroy the superior riding qualities built into this part.

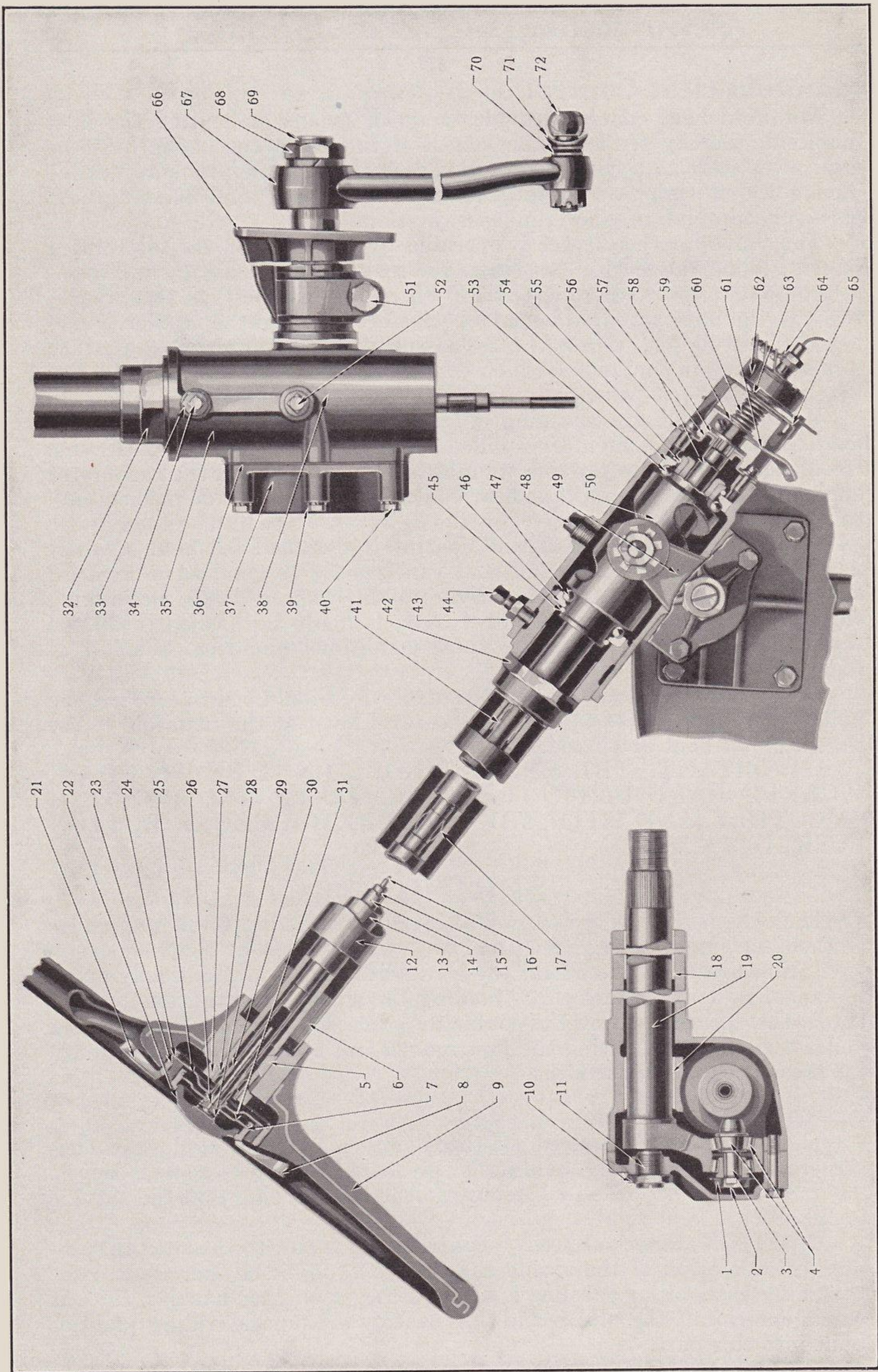


Fig. 24—Steering Gear

The springs are permanently lubricated and wrapped before the metal spring covers are installed.

STEERING GEAR

General Description

The steering gear is of the semi-irreversible roller mounted cam and lever type, the angle of the cam permitting the wheels to follow slight road deviations but not transmitting road shocks to the steering wheel. The steering wheel shaft carries at its lower end a spiral cam, into which fits a roller bearing mounted stud carried by the cam lever on the steering arm shaft. As the wheels turn from the straight-ahead position the leverage increases. The steering worm is of heat-treated, hardened alloy steel. The steering arm shaft and cam lever is a heat-treated, alloy steel forging. The steering arm, an alloy steel forging, is mounted on the steering arm shaft on a serrated taper, secured by a heavy nut lockwasher.

The steering wheel is three-spoked, with small rim of hard rubber over a pressed steel spider. The throttle and lamp control hand levers and the horn button are mounted above the steering wheel with the control connections carried down through the hollow steering wheel shaft.

The position of the steering wheel is adjustable vertically and adjustment is provided for wear in the gear itself.

Care and Lubrication

The steering gear requires very little care other than regular lubrica-

Fig. 24—Steering Gear

- | | |
|--|---|
| 1—Steering gear trunnion shaft bearing stud nut lockwasher | 36—Steering gear housing cover gasket |
| 2—Steering gear trunnion shaft bearing stud nut | 37—Steering gear housing cover |
| 3—Steering gear trunnion shaft bearing stud | 38—Steering gear housing |
| 4—Steering gear trunnion shaft bearing cone and rollers | 39—Steering gear housing cover screw—long |
| 5—Steering wheel key | 40—Steering gear housing cover screw—short |
| 6—Steering gear column jacket bushing | 41—Steering gear throttle control tube silencer—lower |
| 7—Steering gear light control tube plate snap ring | 42—Steering gear adjusting nut |
| 8—Steering gear light control upper lever | 43—Steering gear adjusting nut lock screw lock nut |
| 9—Steering wheel | 44—Steering gear adjusting nut lock screw |
| 10—Steering cam adjusting screw lock nut | 45—Steering cam bearing ball race retaining wire |
| 11—Steering cam adjusting screw | 46—Steering cam bearing ball race |
| 12—Steering gear column jacket | 47—Steering cam bearing ball |
| 13—Steering gear cam tube or main tube | 48—Steering gear lubricant plug |
| 14—Steering gear throttle control tube | 49—Steering trunnion shaft |
| 15—Steering gear light control tube | 50—Steering cam |
| 16—Horn button to lighting switch cable | 51—Steering gear frame bracket clamp bolt |
| 17—Steering gear throttle control tube upper silencer | 52—Steering gear lubricant plug |
| 18—Steering trunnion shaft bushing—outer | 53—Steering cam bearing ball |
| 19—Steering trunnion shaft | 54—Steering cam bearing ball race |
| 20—Steering trunnion shaft bushing—inner | 55—Steering cam bearing ball race retaining wire |
| 21—Steering gear throttle control upper lever | 56—Steering gear housing lower end cover gasket |
| 22—Horn button | 57—Steering gear stationary tube and lower cover assembly |
| 23—Steering gear throttle tube ring | 58—Steering gear throttle control lower lever friction washer—large |
| 24—Steering gear throttle control tube plate snap ring | 59—Steering gear throttle control lower lever friction washer—small |
| 25—Steering gear throttle tube upper lever ring plate | 60—Steering gear throttle control tube spring |
| 26—Horn button ferrule | 61—Steering gear throttle control lower lever |
| 27—Steering wheel nut | 62—Lighting switch |
| 28—Steering gear throttle control bushing—upper | 63—Lighting switch spring washer |
| 29—Horn button spring | 64—Lighting switch mounting nut |
| 30—Steering gear light control tube silencer | 65—Steering gear lower control switch bracket |
| 31—Steering gear light control tube upper lever ring plate | 66—Steering gear frame bracket |
| 32—Steering gear adjusting nut | 67—Steering gear arm |
| 33—Steering gear adjusting nut lock screw lock nut | 68—Steering arm nut |
| 34—Steering gear adjusting nut lock screw | 69—Steering trunnion shaft |
| 35—Steering gear housing | 70—Drag link ball dust cover spring |
| | 71—Drag link ball dust cover |
| | 72—Drag link ball |

tion. Occasionally inspect the mounting bolts and the steering column clamp bolts to see that they are tight.

The steering gear case should be filled to the level of the filler plug with special heavy steering gear lubricant, made by a reputable manufacturer, every 5000 miles (8000 km.). In very cold climates this lubricant may be somewhat diluted with engine oil if necessary. Never use any solid lubricant, cup grease, or any oil or grease containing graphite in the steering gear.

Adjustments

Upon the proper adjustment of the steering gear depends much of the ease of operation and the safety of the car. Adjustments should be attempted only by those confident of their ability and with the needed equipment to make them.

When making adjustments to the steering gear the front wheels should be raised from the floor so that they may be accurately placed at any angle, and the drag link should be disconnected from the steering arm to free the gear itself from outside influences.

Since the gear is designed to give increasing leverage as the wheels turn from their central position, it is important that when the wheels are in the straight-ahead position the cam lever be in the center of the cam, as shown by the steering wheel being in its mid-position of travel from full left to full right. These relative positions are set by placing the steering arm at the proper angle on the steering arm shaft as permitted by the serrations.

To adjust the position of the steering wheel: Loosen steering gear bracket clamp bolt. Remove steering column bracket bolt (back of instrument board). Raise or lower steering column to desired position. Replace steering column bracket bolt and tighten steering gear bracket clamp bolt. Turn steering wheel through full travel to check for binding, also check steering wheel for mid-position, and throttle for full opening and closing.

To remove and replace steering arm: To remove the arm use a special puller. When replacing the arm, put it in position on the serrations and draw into place with the nut. Never remove the arm by driving a wedge between it and the car frame. Never drive the arm into place with heavy blows. Either of these practices will result in serious damage to the gear.

To adjust end play in steering cam: End play in the cam is shown by backlash accompanied by rising and falling of the steering wheel as turned from side to side. Loosen the steering column clamp screws (below the steering column at the instrument board). Loosen the bearing adjusting nut lock screw (No. 44, Fig. 24) and screw lock nut (No. 43) at the top of the steering gear case. By turning the large bearing adjusting nut (No. 42), adjust the bearing tight enough to allow no perceptible end play but without binding. Tighten bearing adjusting screw lock screw and screw lock nut. Tighten steering column clamp screws.

To adjust backlash of cam lever stud in cam: Looseness of the stud in the cam is shown by backlash in the steering wheel, without rising and falling of the wheel. The stud (No. 3) is tapered and backlash is removed by forcing it deeper into the tapered groove in the cam. Care must be exercised not to make the adjustment too tight, .002" to .003" (.051 to

.076 mm.) end play being allowed in the steering arm shaft which is fastened to the cam lever. Place cam lever in its mid-position. Loosen the cam lever adjusting screw lock nut (No. 10, Fig. 24). See that the nuts which hold the cover in place are tight. Adjust end play by the adjusting screw (No. 11). Tighten lock nut. Recheck end play.

Loose body bolts will permit the body to shift sufficiently to cause misalignment between the steering post and the dash bracket and the steering gear and the frame. This may be corrected by first tightening the body bolts and then loosening the steering gear at the frame and dash, allowing it to seek its natural position. The steering column should enter the dash bracket without an undue amount of pressure and the column bracket and steering gear bracket bolts tightened.

Steering Connections

The steering gear connections and front axle tie rod should be inspected frequently, as well as the front wheel alignment. (Page 15.)

TRANSMISSION

Multi-Range Gearshift

The new Multi-Range Gearshift used on the Chrysler Imperial Eight has the following gear arrangement (Fig. 25, also center insert):

The main drive pinion (No. 17, page 70) and the direct drive clutch teeth (62) are integral with the clutch shaft (17). The pinion (20) is in constant internal mesh with the main drive pinion idler gear (12) which is an integral part of the main drive pinion idler assembly. The countershaft drive gear (11) and the accelerating range idler drive gear (6) are also integral parts of this assembly.

The countershaft drive gear (11) is in constant mesh with the countershaft gear (24) and the accelerating range idler drive gear (6) is in constant internal mesh with the accelerating range idler gear (53).

The accelerating range idler gear (53) is an integral part of the accelerating range idler assembly (60) which also carries, as an integral part, the accelerating range idler gear drive teeth (46).

Speed range is obtained by moving the accelerating range and direct drive sliding clutch (66) on the mainshaft forward into mesh with the direct drive clutch (62).

Accelerating range is obtained by moving the accelerating range and direct drive sliding clutch (66) on the mainshaft backward into mesh with the accelerating range idler gear drive teeth (46).

Starting range, heavy duty, and reverse are formed in the conventional way by sliding gears on the mainshaft into mesh with gears on the countershaft.

Gearshift

For all normal driving conditions, the gearshift (37) is standard. For starting range the gearshift lever should be moved to the left from neutral and backward. For accelerating range to the right from neutral and forward. For speed range to the right from neutral and backward. For reverse to the left from neutral and forward. With this arrangement, the shift from neutral to starting, from starting to accelerating, and from accelerating to speed range is not unusual.

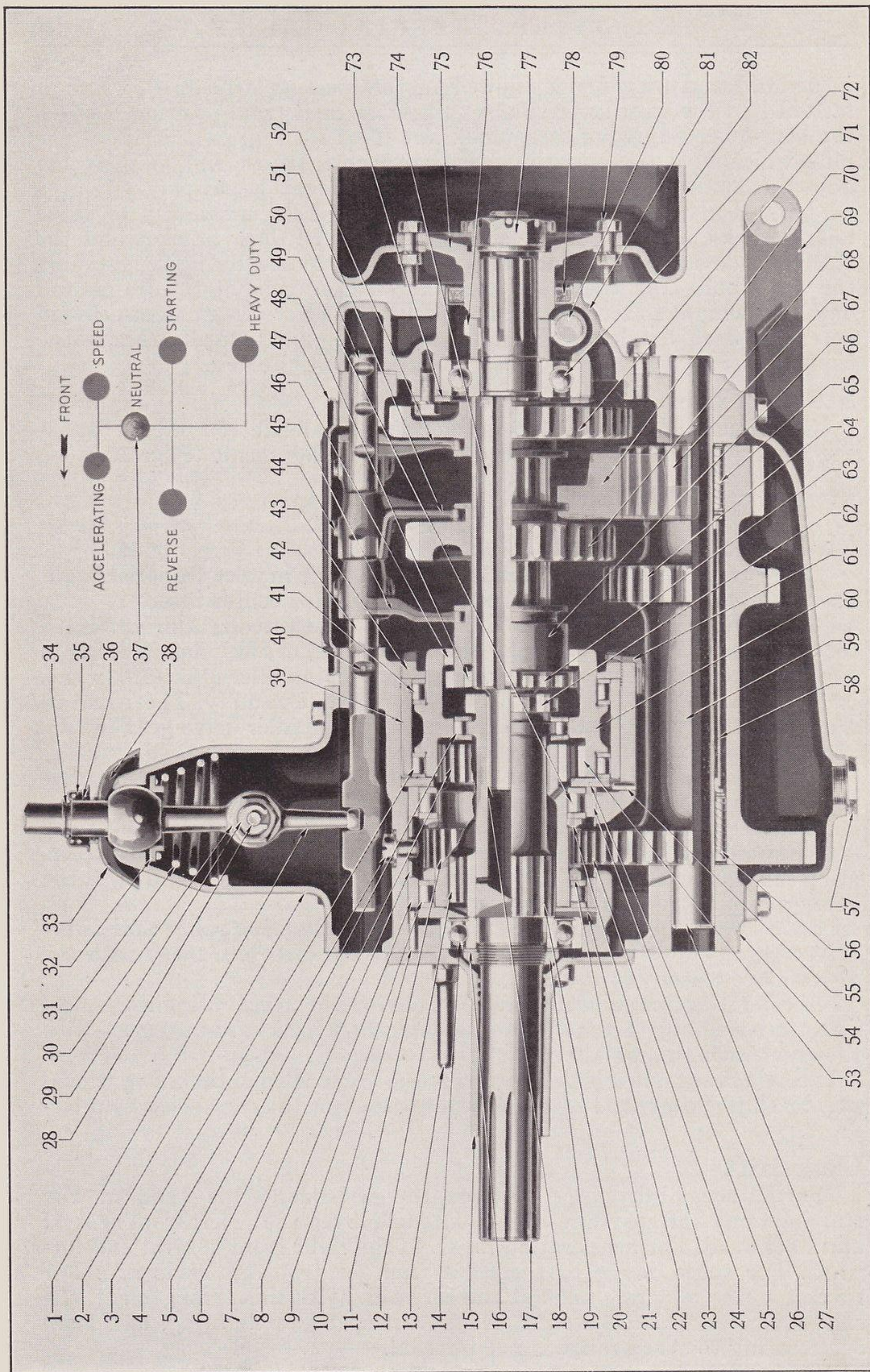


Fig. 25—Multi-Range Gearshift

Heavy duty range is a forward speed which provides power at the rear wheels for starting and driving under unusual operating conditions such as extremely steep grades, or deep mud, sand, or snow. To engage this speed the gearshift lever must be moved to the extreme left against spring pressure and then backward.

CAUTION: If at any time it becomes necessary to shift from the heavy duty range to the starting speed, care should be exercised not to shift into reverse while the car is moving forward.

Lubrication

The correct lubrication of the transmission is of the utmost importance

Fig. 25—Multi-Range Gearshift

- | | |
|---|--|
| 1—Transmission gearshift hand lever | 40—Transmission gearshift bar interlock spacer |
| 2—Transmission gearshift housing | 41—Transmission accelerating (third) range idler gear bearing |
| 3—Transmission accelerating (third) range idler gear bearing | 42—Transmission gearshift bar—accelerating and speed (third and direct) range |
| 4—Transmission drive pinion idler gear bearing spacer dowel | 43—Transmission accelerating (third) range idler gear bearing retainer |
| 5—Transmission drive pinion pilot bearing | 44—Transmission gearshift fork pin |
| 6—Transmission drive pinion idler gear (accelerating range idler drive teeth) | 45—Transmission gearshift fork—accelerating and speed (third and direct) range |
| 7—Transmission drive pinion idler gear bearing race spacer | 46—Transmission accelerating (third) range idler gear (accelerating range drive teeth) |
| 8—Transmission drive pinion idler gear bearing race | 47—Transmission case upper cover |
| 9—Transmission drive pinion idler gear bearing—front | 48—Transmission accelerating and speed (third and direct) range sliding clutch (direct drive teeth) |
| 10—Transmission drive pinion idler gear thrust washer dowel | 49—Transmission drive pinion idler gear bearing—rear |
| 11—Transmission drive pinion idler gear (countershaft gear drive teeth) | 50—Transmission gearshift bar—starting (second) and reverse range |
| 12—Transmission drive pinion idler gear (internal idler drive teeth) | 51—Transmission gearshift fork—starting (second) and reverse range |
| 13—Clutch release bearing sleeve guide | 52—Transmission gearshift fork—heavy duty (first) range |
| 14—Transmission drive pinion bearing | 53—Transmission accelerating (third) range idler gear (internal driver teeth) |
| 15—Transmission drive pinion bearing retainer | 54—Transmission case |
| 16—Transmission drive pinion bearing lock nut lockwasher | 55—Transmission accelerating (third) range idler gear thrust washer dowel |
| 17—Transmission drive pinion (clutch shaft) | 56—Transmission countershaft bearing |
| 18—Transmission shaft pilot bushing | 57—Transmission case drain plug |
| 19—Transmission drive pinion bearing lock nut | 58—Transmission countershaft bearing spacer |
| 20—Transmission drive pinion (external idler drive teeth) | 59—Transmission countershaft gear |
| 21—Transmission drive pinion idler gear bearing spacer—front | 60—Transmission accelerating (third) range idler gear |
| 22—Transmission drive pinion idler gear thrust washer | 61—Transmission accelerating (third) range idler gear bearing retainer lock |
| 23—Transmission drive pinion idler gear bearing spacer—rear | 62—Transmission drive pinion (sliding clutch direct drive teeth) |
| 24—Transmission countershaft gear (countershaft gear driver teeth) | 63—Transmission accelerating and speed (third and direct) range sliding clutch (accelerating range driver teeth) |
| 25—Transmission drive pinion idler gear bearing race | 64—Transmission countershaft gear (starting range teeth) |
| 26—Transmission accelerating (third) range idler gear thrust washer | 65—Transmission countershaft bearing |
| 27—Transmission countershaft | 66—Transmission accelerating and speed (third and direct) range sliding clutch |
| 28—Transmission gearshift heavy duty (first) range stop plunger | 67—Transmission countershaft gear (heavy duty and reverse teeth) |
| 29—Transmission gearshift heavy duty (first) range stop plunger washer | 68—Transmission sliding gear—starting (second) and reverse range |
| 30—Transmission gearshift heavy duty (first) range stop plunger spring retainer check nut | 69—Transmission case lower cover |
| 31—Transmission gearshift hand lever spring | 70—Transmission reverse idler gear |
| 32—Transmission gearshift hand lever spring seat | 71—Transmission sliding gear—heavy duty (first) |
| 33—Transmission gearshift hand lever dust cover | 72—Transmission shaft rear bearing |
| 34—Transmission gearshift hand lever dust cover spring retainer lock ring | 73—Transmission shaft rear bearing retaining plate |
| 35—Transmission gearshift hand lever dust cover spring retainer | 74—Transmission shaft |
| 36—Transmission gearshift hand lever dust cover spring | 75—Transmission shaft flange |
| 37—Transmission gearshift hand lever in neutral position | 76—Speedometer drive gear |
| 38—Transmission gearshift hand lever dust cover washer | 77—Transmission shaft flange nut |
| 39—Transmission accelerating (third) range idler gear bearing race | 78—Transmission shaft rear bearing oil washer |
| | 79—Propeller shaft bolt (transmission end) |
| | 80—Speedometer drive pinion |
| | 81—Transmission brake support |
| | 82—Transmission brake drum |

to insure long life and satisfactory operation. It is recommended that high-grade fluid gear lubricant be used.

For the proper grade of lubricant the nearest Chrysler distributor or dealer should be consulted.

It is recommended that the lubricant be changed in the transmission after the first 500 miles (800 km.) of driving and the transmission be thoroughly washed out with a flushing oil (not kerosene). The transmission should then be refilled to the level of the filler plug on the right side with the proper lubricant. It is recommended that the lubricant in the transmission be removed, the transmission case flushed and new lubricant installed every six months thereafter.

Removal and Installation

If it becomes necessary to remove the transmission for any reason, care should be taken to keep it in perfect alignment with the engine while removing and installing in order to avoid springing the clutch driving disc or the clutch shaft. This is extremely important. To maintain perfect alignment, pilot studs should be used in the clutch housing to aid in disassembling and assembling the transmission.

TIRES

Water and road dirt will work into cuts in tires and loosen the rubber from the carcass unless the cuts are promptly and properly sealed. It is also important that the air pressure in the tires be properly maintained at all times.

Tire Pressures

To insure smooth and steady steering operation at all speeds, the air pressure, in both front and rear tires, should be exactly 40 pounds as measured with an accurate gauge for balloon tires and checked at least once each week.

UNIVERSAL JOINTS AND PROPELLER SHAFT

Universal joints are used at each end of the propeller shaft connecting the transmission to the rear axle. The universal joints transmit the power of the engine and at the same time allow the rear axle to rise and fall with the irregularities of the road.

The universal joints are of the yoke and cross type and require no attention other than periodic lubrication every 2000 miles (3200 km.) with special universal joint or fibre grease. Only two ounces are necessary, inasmuch as over-lubrication will cause the grease to be thrown out past the retainers.

The front yoke of the front universal joint is fastened to the transmission main shaft and its rear yoke has a splined hole into which slips the splined front end of the propeller shaft, leaving the shaft free to slide backward and forward. A felt washer with retainer holds the lubricant and prevents the entrance of road dirt around the spline. The two yokes are joined by a cross, the ends of which turn in bushings carried by the yokes.

The construction of the rear universal joint is similar to that of the front, the front yoke being integral with the propeller shaft, while the rear yoke is fitted to the drive pinion shaft of the rear axle.

The universal joints and propeller shaft are carefully balanced to prevent vibration. The yokes and shaft are marked and should they ever be disassembled they should always be reassembled in their original positions.

WHEELS

Each front wheel is supported by two adjustable roller bearings. The adjustment is made by first jacking up the axle until one wheel just clears the floor. Then the wheel should be removed. Next the hub cap should be removed as well as the spindle nut cotter pin. The hub should then be spun slowly and the spindle nut turned tighter only until the bearings begin to bind slightly; then the nut should be backed off one notch. The cotter pin, hub cap and wheel should then be reinstalled. A two-ounce weight (.057 kg.) should bring that part to a stop at the bottom of the wheel. The front wheel bearings must be free and have very slight end shake. The wheel bearings should be cleaned and packed with medium cup grease every 5000 miles (8000 km.).

IMPORTANT: It is of vital importance that the front wheels (complete with tires) be as near perfectly balanced at all times as is possible in order to avoid so-called "tramping" of front wheels at high speeds. The rapid revolutions of the wheels develop gyroscopic forces, which, combined with unbalanced wheel forces, will cause severe wobble and bounding motion of the front wheels. These forces reverse their direction very rapidly, and, because of this fact, heavy strains are developed in the

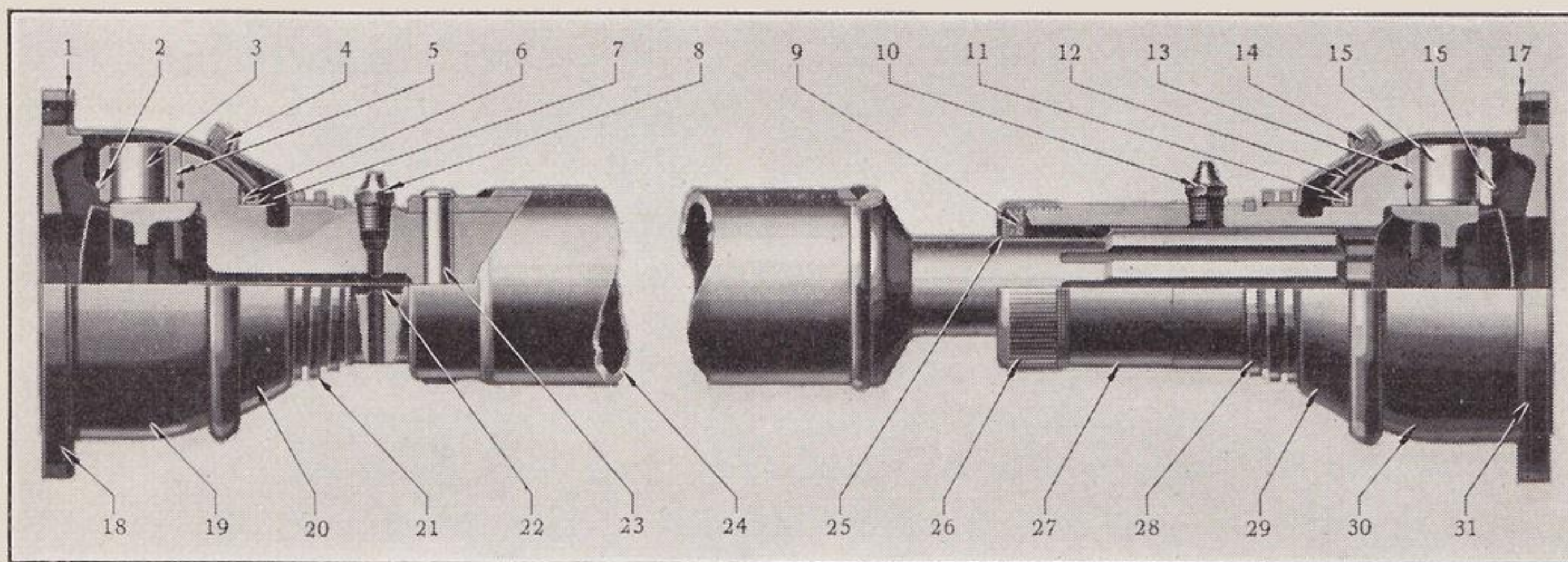


Fig. 26—Propeller Shaft and Universal Joints

- | | |
|--|--|
| 1—Universal joint dust cover gasket | 18—Universal joint flange yoke |
| 2—Universal joint cross bushing retaining ring | 19—Universal joint housing |
| 3—Universal joint cross | 20—Universal joint dust cover and packing assembly |
| 4—Universal joint dust cover packing | 21—Universal joint dust cover spring |
| 5—Universal joint cross bushing | 22—Rear universal joint lubricant passage baffle |
| 6—Universal joint baffle cup spring | 23—Propeller shaft tube to stub yoke coupling pin |
| 7—Universal joint baffle cup | 24—Propeller shaft tube assembly |
| 8—Rear universal joint lubricant nipple | 25—Front universal joint lubricant retaining washer |
| 9—Front universal joint lubricant retaining felt | 26—Front universal joint lubricant felt retainer cap |
| 10—Front universal joint lubricant nipple | 27—Front universal joint yoke—long |
| 11—Universal joint baffle cup spring | 28—Universal joint dust cover spring |
| 12—Universal joint baffle cup | 29—Universal joint dust cover and packing assembly |
| 13—Universal joint cross bushing | 30—Universal joint housing |
| 14—Universal joint dust cover packing | 31—Universal joint flange yoke |
| 15—Universal joint cross | |
| 16—Universal joint cross bushing retaining ring | |
| 17—Universal joint dust cover gasket | |

steering mechanism. For similar reasons it is equally important to maintain uniform tire pressures. Unequal and low pressure in the two front tires will cause much annoyance when driving at high speeds.

The same condition is true with the rear wheels, as the strains are transmitted to the axle shafts and their bearings, but are not so apparent. Excessive tire wear also results from poorly balanced wheels when driven at high speeds.

Irregularities in wheel and tire balance caused by the weight of the tire valve stem and dust cap are offset by the manufacturer's method of tire construction.

On the side wall of each tire near the bead is a colored dot marked on the rubber. When mounting the tire on the rim, the valve stem should be located at a point immediately adjacent to the dot, thus permitting the distribution of weight in the tire to compensate for the weight of the valve stem and dust cap.

CORRECTIVE MEASURES

No adjustments should be made nor any parts tampered with until the cause of the trouble is known. Otherwise adjustments which are properly made may be destroyed. The problem should be analyzed.

Engine Fails to Start

1. Lack of fuel.
Fuel line should be free of obstructions.
2. Lack of ignition current.
May be due to failure to turn the switch or to a broken or disconnected wire. Ammeter needle will move when ignition current flows through breaker points.
3. Fouled spark plugs.
Due to an excessive amount of oil in the engine and too long use, whereby the points become coated with carbon. Fouled spark plugs should be removed and cleaned or replaced with new.
4. Points improperly set. (No. 3 under "Engine Misses".)
5. The carburetor choke valve must be closed tightly.

Engine Stops

1. Lack of fuel.
2. Disconnected wires.
3. Lack of oil.
4. Carburetor flooding.

Engine Misses

1. Broken or disconnected wiring.
2. Fouled spark plugs.
The spark plugs should be short-circuited one after another by touching a hammer or screwdriver from the metal of the cylinders to the terminals of the spark plugs. When one is reached which makes no difference in the running of the engine, this is probably the plug at fault.
Remove and clean. Porcelain insulation may be cracked.
3. Points of spark plugs improperly set.
Points too close together or too far apart may cause missing. Spark plug points should be set .022" (.559 mm.) apart.
4. Loss of compression in any cylinder.
Valve may be stuck or there may be dirt under it. Examine the valve tappet to see whether the valve seats properly. To locate cylinder that is weak on compression, the engine should be turned over by hand and each cylinder tested in turn. If engine misses when hot, tappet clearances should be checked. (Page 57)
5. Water in fuel.
6. Overheating.
7. Carburetor adjustment should be checked.

Loss of Power

The engine will run, but will not pull the car under a heavy load. May be due to:

- Too rich mixture.
- Valves not seating.
- Less than normal tappet clearance.
- Ignition improperly timed.
- Lack of oil or water.
- Lack of fuel, due to obstruction in fuel pipe or carburetor.
- Screen filled with dirt.
- Dragging brakes.
- Engine overheating.
- Loss of compression.

Lack of Compression

- Faulty cylinder head gasket.
- Insufficient tappet clearance.
- Valves or rings not seating.
- One or more improperly fitted pistons or piston rings.

Popping Back Through Carburetor

This usually indicates too lean a mixture, but may be caused by:

- Dirt in carburetor.
- Inlet valves holding open.
- Water in the fuel.
- Air leak at intake manifold connections.
- Incorrect ignition timing or limited spark advance.
- Secondary wires connected to the incorrect plugs.
- Improper kind or defective spark plugs.

Engine Overheats

- Lack of proper lubrication.
- Stoppage of water circulation or lack of water.
- Slipping fan belt.
- Imperfect gas mixture.
- Ignition timed late or driving with retarded spark.
- Limited spark advance.

Engine Knocks

- Connecting rod bearing loose.
- Crankshaft bearing loose.
- Faulty engine lubrication or diluted oil.
- Loose piston.
- Broken piston ring.
- Carbon in cylinders.
- Overheating.
- Incorrect ignition timing.

TOOLS

The following is a complete list of tool equipment furnished with the Chrysler Imperial Eight. The tools are of first quality and carefully designed so as to take care of all work which an owner may wish to perform on the car.

1 Wheel wrench	1 No. 1 wrench
1 Brake cylinder bleeder hose assembly	1 No. 2 wrench
1 Brake cylinder bleeder hose connection gasket	1 No. 3 wrench
1 High-pressure lubricant gun	1 No. 4 wrench
1 Tire pump	1 Pliers
1 Auto jack	1 Hammer
1 Auto jack handle	1 Spark plug wrench and handle
1 Starting crank assembly	1 Screwdriver, small
	1 Screwdriver, large
	1 Auto wrench

ACCESSORY REPAIRS

All matters relative to the servicing of the accessories used on the Chrysler Imperial Eight should be referred to an authorized Chrysler Service Station, and if possible to the Service Station of the Dealer from whom your car was purchased.

While the manufacturers of the accessories listed below issue their own individual warranties, all Chrysler Service Stations will be pleased to assist you to obtain the proper service from these units.

Regular inspection and lubrication of these units is just as essential as for all other units of your car, and is the best assurance of continued satisfactory and economical operation. Therefore, we recommend that you have an authorized Chrysler Service Station inspect these units regularly, and should service be required, the Chrysler Service Station will extend the same high degree of competent service that they are prepared and willing to extend on all other units of your car.

Battery

The Willard Storage Battery Co., Cleveland, Ohio.

Carburetor

Bendix-Stromberg Carburetor Co., South Bend, Indiana.

Ignition Coil, Distributor, Starting Motor, Generator, Fuel Pump, Speedometer and Horns

United Motors Service, Inc., Detroit, Mich.

Shock Absorbers

Houde Engineering Corporation, Buffalo, N. Y.

Windshield Wiper

Trico Products Corp., Buffalo, N. Y.

Radio Equipment (Special Equipment)

Transitone or Willard Service Stations.

DETAILED SPECIFICATIONS

Axle—Rear

Semi-floating, pressed steel housing $\frac{3}{16}$ " (4.8 mm.) thick. Drive gear and pinion spiral bevel type, nickel chrome-vanadium steel, heat-treated. Drive gear $11\frac{1}{2}$ " (292.1 mm.) in diameter and $1\frac{1}{2}$ " (38.1 mm.) wide. Gear ratios—Five Passenger and Close-Coupled Sedan 3.818 to 1; Seven Passenger Sedan, Sedan-Limousine and Cowl Chassis 4.10 to 1. Axle shafts: Forgings of high alloy, chrome-nickel steel, heat-treated, splined into differential side gears, keyed to wheel hub, $1\frac{5}{8}$ " (41.3 mm.) diameter at outer bearing end.

Axle—Front

Heat-treated, I-section drop forgings. Adjustable tapered roller wheel bearings. Yoke bushings: Bronze, $\frac{7}{8}$ " (22.2 mm.) inside diameter, $\frac{1}{16}$ " (1.59 mm.) thick, $1\frac{7}{16}$ " (36.5 mm.) long at the top and $1\frac{1}{2}$ " (38.1 mm.) long at the bottom. Ball thrust bearings at steering knuckle head. Steering knuckles are of chrome-nickel steel forgings. Steering arms are of chrome-vanadium steel forgings.

Battery

Three-cell, 17-plate, six-volt, 153 ampere-hour capacity, located under front compartment floor board.

Bodies

Chrysler designed.

Brake—Service

Chrysler hydraulic, internal-expanding. Drums 15" (381.0 mm.) inside diameter, brake shoes $1\frac{3}{4}$ " (44.4 mm.) wide.

Brake—Parking

External contracting on drum mounted at rear of transmission, hand-controlled. Drum 8" (203.2 mm.) in diameter, dynamically balanced, brake band 2" (50.8 mm.) wide.

Camshaft

Mounted on six steel-backed babbitt-lined bearings, No. 1 bearing $2\frac{1}{4}$ " (57.1 mm.) diameter, $1\frac{7}{16}$ " (36.5 mm.) long; No. 2 bearing $2\frac{7}{32}$ " (56.3 mm.) diameter, $\frac{11}{16}$ " (17.5 mm.) long; No. 3 bearing $2\frac{3}{16}$ " (55.6 mm.) diameter, $\frac{11}{16}$ " (17.5 mm.) long; No. 4 bearing $2\frac{5}{32}$ " (54.8 mm.) diameter, $\frac{11}{16}$ " (17.5 mm.) long; No. 5 bearing $2\frac{1}{8}$ " (54.0 mm.) diameter, $\frac{11}{16}$ " (17.5 mm.) long; rear bearing $1\frac{5}{8}$ " (41.3 mm.) diameter, $1\frac{3}{8}$ " (34.9 mm.) long. Oil pump and distributor drive gear and fuel pump eccentric integral with camshaft. Camshaft is drilled through the center and oil, under pressure, is forced through this passage, giving positive lubrication to all its bearings.

Carburetor

Dual down-draft plain tube type, provided with idle speed adjustments, with fixed jets, covering all necessary ranges to compensate for variations of altitude, peak summer and winter conditions. Equipped with automatic adjustable accelerator pump, air cleaner, and manifold heat control.

Clutch

The clutch is of the single dry plate type. Driven disc 11" (279.4 mm.) in diameter, torque cushioned by rubber insert. Driving disc has asbestos composition facings riveted to each side.

Connecting Rods

I-beam section. Drop-forged alloy steel. 10" (254.0 mm.) between centers. Crankshaft bearing is babbitt cast in rod $2\frac{3}{16}$ " (55.6 mm.) diameter by $1\frac{3}{8}$ " (34.9 mm.) wide. Two bronze piston pin bushings in rod— $\frac{55}{64}$ " (21.82 mm.) in diameter, $\frac{9}{16}$ " (14.3 mm.) long.

Control

Conventional left hand drive, center control. Headlight filament control, throttle lever and horn button at top of steering column. Stoplight operates with brake pedal. Other lights operated by separate switches.

Cooling System

Water capacity $6\frac{1}{2}$ gallons (5.41 Imperial gallons, 24.60 liters), circulated by centrifugal pump driven by extension of fan shaft. Extra large water passages completely surround each cylinder and each valve. Cellular radiator with detachable shell. Six-blade $18\frac{3}{4}$ " (476.2 mm.) fan driven by V-belt with adjustment provided. Thermometer on instrument panel indicates temperature of water in engine. Thermostatically controlled vertical radiator shutters.

Crankshaft

Drop forging, counterweighted, statically and dynamically balanced. Supported on 9 bronze-backed, babbitt-lined main bearings. Front and center bearings $2\frac{3}{4}$ " (69.8 mm.) in diameter, $1\frac{11}{16}$ " (42.9 mm.) long, Nos. 2, 3, 4, 6, 7, and 8 bearings $2\frac{3}{4}$ " (69.8 mm.) in diameter $1\frac{1}{16}$ " (27.0 mm.) long. Rear bearing $2\frac{3}{4}$ " (69.8 mm.) in diameter, $3\frac{1}{4}$ " (82.5 mm.) long. Thrust taken on rear bearing. Crankshaft is drilled to permit oil under pressure (30 to 35 pounds) being forced to all bearings. Impulse neutralizer.

Cylinders

Eight, cast en bloc, integral with crankcase, with heavy cross web construction of nine main bearing supports. Detachable cylinder head. Bore $3\frac{1}{2}$ " (88.9 mm.), stroke 5" (127.0 mm.). Finish, reamed and honed. Oil passages are drilled through bosses integral with crankcase casting. Cover plate on left hand side provides easy access to water passages.

Drive

Hotchkiss type horizontal drive.

Engine

L-type, water-cooled, eight cylinders, four-cycle. Bore $3\frac{1}{2}$ " (88.9 mm.), stroke 5" (127.0 mm.), N. A. C. C. horsepower 39.20, developed horsepower 125, piston displacement 384.84 cubic inches (6308.85 cc.). Suspension: Four-point, rear, brackets bolted to flywheel housing and frame side member; front bolted to frame crossmember. Insulated with rubber front and rear. Unit type. Firing order 1-6-2-5-8-3-7-4. Full force feed lubrication to all crankshaft, camshaft and connecting rod bearings. Spray from small metered hole in connecting rod bearings lubricates cylinders. Nine-bearing crankshaft. Six-bearing camshaft.

Electrical System

Generator—Third-brush regulation, six-volt type. Starting Motor—Six-volt type with manual engagement. Battery—Six-volt, 153 ampere-hour capacity. Single wire system.

Fenders and Running Boards

Fenders—Heavy sheet steel, bonderized with lacquer finish, assembled to car with fabric packing strips. Steel running board, rubber-covered.

Flywheel

Gray iron, dynamically and statically balanced. Steel starter gear shrunk on flywheel.

Frame

Pressed steel, wide flange. Channel 8" (203.2 mm.) deep. Length $196\frac{1}{2}$ " (4.99 m.). Thickness $\frac{9}{16}$ " (3.57 mm.). Flanges $2\frac{1}{4}$ " (57.1 mm.) wide. Six crossmembers.

Fuel System

Fuel pump driven from camshaft, visible sediment trap. $21\frac{1}{2}$ -gallon (17.91 Imperial gallons, 81.38 liters) fuel tank mounted at rear of frame. Fuel supply tank of rustproof, Terne plate.

Horns

Two modern vibrator type with adjustable diaphragms for tone. Located under hood. Button on top of steering column.

Ignition

Side outlet waterproof four lobe cam double breaker arm type distributor. Semi-automatic advance. Six-volt battery ignition.

Lamps

Bullet type chrome plated headlamps with double filament center bulbs, parking lamps, instrument panel lamp, tail and stop signal lamps on all cars; dome lamp on Sedans. Corner lamps on Seven Passenger Sedan and Sedan-Limousine.

Lubrication—Engine

High pressure to all crankshaft, connecting rod and camshaft bearings. Pump located in oil pan, driven by timing shaft from spiral gear on camshaft. All other working parts lubricated by positive spray under pressure from metered hole in upper half of each connecting rod bearing, also from crankshaft and camshaft. Timing chain lubricated by direct oil leads. Oil-filtered, cleansed and cooled by circulation through oil filter mounted on the engine. Oil capacity $8\frac{1}{2}$ quarts (8.05 liters); pressure gauge on dash. Level gauge in conjunction with fuel gauge. Level indicator on left side of crankcase toward the rear from the filler.

Overall Length

$196\frac{1}{2}$ " (4.99 m.) without bumpers, 211" (5.35 m.) with bumpers—all models. Close-Coupled Sedan $212\frac{5}{8}$ " (5.40 m.) with bumpers.

Pistons

Light alloy iso-therm steel strut type. Length $4\frac{1}{8}$ " (104.8 mm.). Fitting clearance .002" (.051 mm.).

Piston Rings

Gray iron, 5 per piston, concentric, 4 upper compression rings, special tongue and groove design $\frac{5}{32}$ " (3.96 mm.) wide. Special oil-control ring in lower groove $\frac{5}{32}$ " (3.96 mm.) wide. All rings above piston pin. Lower compression ring undercut for oil wiper effect.

Piston Pins

Alloy steel, case-hardened and lapped, $\frac{55}{64}$ " (21.82 mm.) in diameter by $2\frac{7}{8}$ " (73.0 mm.) long, floating in piston and rod.

Propeller Shaft

Steel tubing, forged ends electrically welded, diameter $2\frac{1}{2}$ " (63.5 mm.).

Spark Plugs

Metric thread, heavy electrodes.

Shock Absorbers

Two-way hydraulic. Standard equipment on all models.

Springs

Semi-elliptic. Front: Length $39\frac{1}{4}$ " (.996 m.), width $2\frac{1}{2}$ " (63.5 mm.), 9 leaves. Rear: Length $57\frac{1}{2}$ " (1.46 m.), width $2\frac{1}{2}$ " (63.5 mm.), 8 leaves all body types. Permanently lubricated, and equipped with metal spring covers. Mounted in special rubber insulated shackles.

Steering Gear

Semi-irreversible roller mounted cam and lever type. Adjustable for wear. Steering arm drop-forging heat-treated. $18\frac{1}{2}$ " (.46 m.) 3-spoke wheel. Steering column adjustable.

Timing Chain

Silent chain. Two sprockets.

Tires

Balloon cords, 6-ply non-skid tread on all wheels, size 7.50 x 17" (190.5 x 431.8 mm.).

Transmission

Multi-range gearshift with double internal gear accelerating range. Main drive pinion (clutch shaft) supported by ball bearings in transmission case and a roller bearing in the accelerating range clutch. Mainshaft supported by ball bearings in case and a bronze bearing in main drive pinion. Countershaft gears mounted on roller bearings on stationary countershaft. Idler pinions mounted on roller bearings.

Transmission Ratios		Final Drive	
		5-Pass. and Close Coupled Sedan	7-Pass. Sedan, Sedan-Limousine and Chassis
Speed (Direct)	1.000 to 1	3.818 to 1	4.100 to 1
Accelerating	1.412 to 1	5.391 to 1	7.389 to 1
Starting	2.354 to 1	8.988 to 1	9.651 to 1
Heavy Duty	3.385 to 1	12.924 to 1	13.878 to 1
Reverse	2.915 to 1	11.129 to 1	11.951 to 1

Tread

58½" (1.48 m.) front, 60" (1.52 m.) rear (wire wheels).

Universal Joints

Two used. Yoke and cross type.

Valve Tappets

Mushroom type. Chilled cast iron head welded to hollow steel stem. Mounted in groups of four in detachable brackets. Tappet clearance: Exhaust .007" (.179 mm.), intake .005" (.127 mm.).

Valves

Inlet, flat head chrome-nickel steel. Exhaust, "CNS" steel. Location: Right side, enclosed. Clear diameter of opening: Inlet 1⅞" (39.7 mm.), exhaust 1⅞" (36.5 mm.), stem ⅜" (8.73 mm.), 45-degree seat. Lift ⅝" (7.94 mm.). Valve stem guides removable.

Wheels

Wire. Standard equipment.

Windshield Wipers

Two, automatically operated by engine suction with control valve on each wiper.

GENUINE PARTS

If, for any reason, Chrysler Imperial Eight parts are required, Chrysler owners should be sure to insist on *genuine* parts from the Chrysler Motors Parts Corporation. It is a matter of great importance to do this. If it is ever necessary to have a Chrysler car repaired at any except an authorized Chrysler Service Station, owners should insist upon the following notation being placed on the invoice rendered for the repair work:

“Genuine Chrysler Parts Used in Making These Repairs”

Parts from the Chrysler Motors Parts Corporation are of standard production quality, engineered, manufactured and *inspected* to afford in every respect the same high standard of quality as required in the building of Chrysler cars.

Chrysler *genuine* parts are priced in reasonable ratio to their costs, considering the quality and care exercised in their manufacture, as contrasted with non-genuine parts which are made and sold solely for profit.

Only the Chrysler Motors Parts Corporation could have the unfailing insistence that its parts should invariably be of the best quality.

Genuine Chrysler parts carry the same warranty as Chrysler cars. If a new part proves defective within ninety days, another will be furnished gratis.

INSIST ON

GENUINE CHRYSLER PARTS

ORDERING PARTS

Chrysler Imperial Eight owners are kindly requested to purchase parts from Chrysler Service Stations, where adequate stocks of "Genuine Chrysler Parts" are carried. Should a dealer not have a desired part on hand, it can be quickly obtained by the dealer from the Chrysler Motors Parts Corporation.

The car serial number, located on right front door hinge pillar post, should be mentioned in any orders or correspondence regarding the car to assist the dealer's service department to promptly and intelligently fill the orders or answer the correspondence. Chassis shipped without bodies have serial number plate built into frame right side member vertical section just forward of the rear end of the hood.

Parts of accessories to the car not manufactured by the Chrysler Corporation should be ordered from the respective manufacturers or service stations. (See list, Page 77.) Chrysler Service Stations will assist in this service.

RETURNING PARTS

Chrysler Service Stations have been supplied with special forms and tags that greatly expedite the handling of parts returned to the factory for inspection and credit consideration. Owners are kindly requested to make all parts returns through Chrysler Service Stations.

Parts of accessories to the car not manufactured by the Chrysler Corporation should be sent to the respective manufacturers or service stations. (See list, Page 77.) Chrysler Service Stations will gladly perform this service for Chrysler owners.

Any part sent to the Company with a request for free replacement is to be returned through a Chrysler Distributor or Chrysler Service Station for factory credit consideration. No charge is permissible to the owner by the Distributor or any Chrysler Service Station for handling the claim or the material.

WARRANTY

(Standard Warranty of the National Automobile
Chamber of Commerce)

“We warrant each new motor vehicle manufactured by us, whether passenger car or commercial vehicle, to be free from defects in material or workmanship under normal use and service, our obligation under this warranty being limited to making good at our factory any parts or part thereof which shall within ninety (90) days after delivery of such vehicle to the original purchaser be returned to us with transportation charges prepaid, and which our examination shall disclose to our satisfaction to have been thus defective; this warranty being expressly in lieu of all other warranties, expressed or implied, and of all other obligations or liabilities on our part, and we neither assume nor authorize any other person to assume for us any other liability in connection with the sale of our vehicles.

“This warranty will not apply to any vehicle which shall have been repaired or altered outside of our factory in any way so as, in our judgment, to affect its stability or reliability, nor which has been subject to misuse, negligence, or accident, nor to any commercial vehicle made by us which shall have been operated at a speed exceeding the factory rated speed, or loaded beyond the factory rated load capacity.

“We make no warranty whatsoever in regard to tires, rims, ignition apparatus, horns or other signaling devices, starting devices, generators, batteries, speedometers or other trade accessories, inasmuch as they are usually warranted separately by their respective manufacturers.”

CHRYSLER SALES CORPORATION

Division of Chrysler Corporation

Detroit, Michigan

The Chrysler Sales Corporation reserves the right to make changes in design or to make additions to or improvements in its product without imposing any obligation upon itself to install them on its product previously manufactured.

