



**MODEL 2MG**

# Gasoline Engine

**ASSEMBLY No. 40890**

**INSTRUCTIONS FOR  
MAINTENANCE AND OPERATION**

**FOR USE WITH:**

CHAIN SAW ASSEMBLY  
EARTH AUGER ASSEMBLY  
CONCRETE VIBRATOR ASSEMBLY  
CONCRETE RUBBING ASSEMBLY  
FLEXIBLE SHAFT GRINDING ASSEMBLY  
WOOD DRILL ASSEMBLY  
SUMP PUMP ASSEMBLY

**MALL TOOL COMPANY**

7740 South Chicago Avenue

CHICAGO 19, ILLINOIS

**PRICE 25 CENTS**





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**Today, as in the past,** time is one of our most precious resources. In the timbering country, on the farm, on construction projects and in all phases of productive industry, modern machines have been invented to conserve this valuable resource. These tools of modern industry have not only saved countless man-hours, but eliminated much labor and lost energy as well.

The power chain saw is one of the recent time and work savers to be added to the long list of productive machines for modern living. Looking into its history, one will find years of research, testing and development... years of improvement that have blossomed today to fulfill the needs of timbermen everywhere. Today, power chain saws are considered a "must" for top efficiency in up-to-date timber producing ... for timber cutting men are constantly working against time ... the quota to be filled, the deadline, the weather and the seasons. That's why man in many lines of forestry, agriculture and construction rely on power chain saws to save time, ease work and boost production.

Here are what experienced men look for in a power chain saw. First, it must be sturdily constructed with quality materials ... reasonably free from mechanical stoppages if it is to hold up and save time. It should be light enough so it may be used without undue strain and fatigue. The majority of these units are carried to the job ... over rough terrain ... here lightness is a necessity. Maneuverability is another must in chain saw design ... to be versatile, a power chain saw must be well balanced and easy to operate. The main objective of any timber cutter is to concentrate on cutting, not on which lever or button to push. Controls should be centered in a convenient location so the operator can easily run the saw without fumbling for switches and changing holds. The correct amount of driving power is a main consideration ... too little power can cut efficiency tremendously .. too much power is wasteful. The cutting capacity of the saw should fit the work ... an oversize unit is awkward ... an undersize saw is inefficient. The saw must be the right size to achieve maximum utilization and full operating economy. These are features to demand in a power chain saw for the finest service ... and to this service, MALL Chain Saws are dedicated.



# THE MALL TOOL COMPANY SERVICE ORGANIZATION

It is the aim of the MALL TOOL COMPANY SERVICE DEPARTMENT to provide prompt and efficient service on all MALL TOOL products. There are 38 Factory Branch Offices throughout the United States and Canada which stock parts and maintain service repair departments prepared to serve MALL customers.

The Service Department is also represented by traveling servicemen who are assigned to territories covering the country to assist in unusual problems or train repair men maintained by large users of MALL TOOLS. These men also train dealer service personnel in order to provide the best service and coverage possible.

## MANUFACTURER'S WARRANTY

It is expressly agreed that there are no warranties, expressed or implied, made either by the Dealer or the Manufacturer on Mall Tools except the Manufacturer's warranty against defective materials or workmanship as follows:

The Mall Tool Company warrants each new tool manufactured by it to be free from defects in material and workmanship under normal use and service, its obligation under warranty being limited to making good at its factory or at any district factory service warehouse, any part or parts thereof which shall, within 30 days after delivery of such tool to the original purchaser, be returned to it with transportation charges prepaid and which at its examination shall disclose to its satisfaction to have been thus defective; this warranty being expressly in lieu of all other warranties, expressed or implied and any other obligations or liabilities on its part, and it neither assumes nor authorizes any other person to assume for it any other liability in connection with the sale of the tools.

This warranty shall not apply to any tool which shall have been repaired or altered nor to expendable parts nor to tools which have been subject to misuse, negligence or accident.

## PACKING

The Model 2MG gasoline engine is contained in one package with an instruction book and a tool kit.

The transmission is contained in another package, and any attachments to go with the unit will be in separate containers.

Remove all items from their cartons and inspect them for damage. Be sure that nothing is discarded with the packing material.

Read the instruction book before proceeding further.



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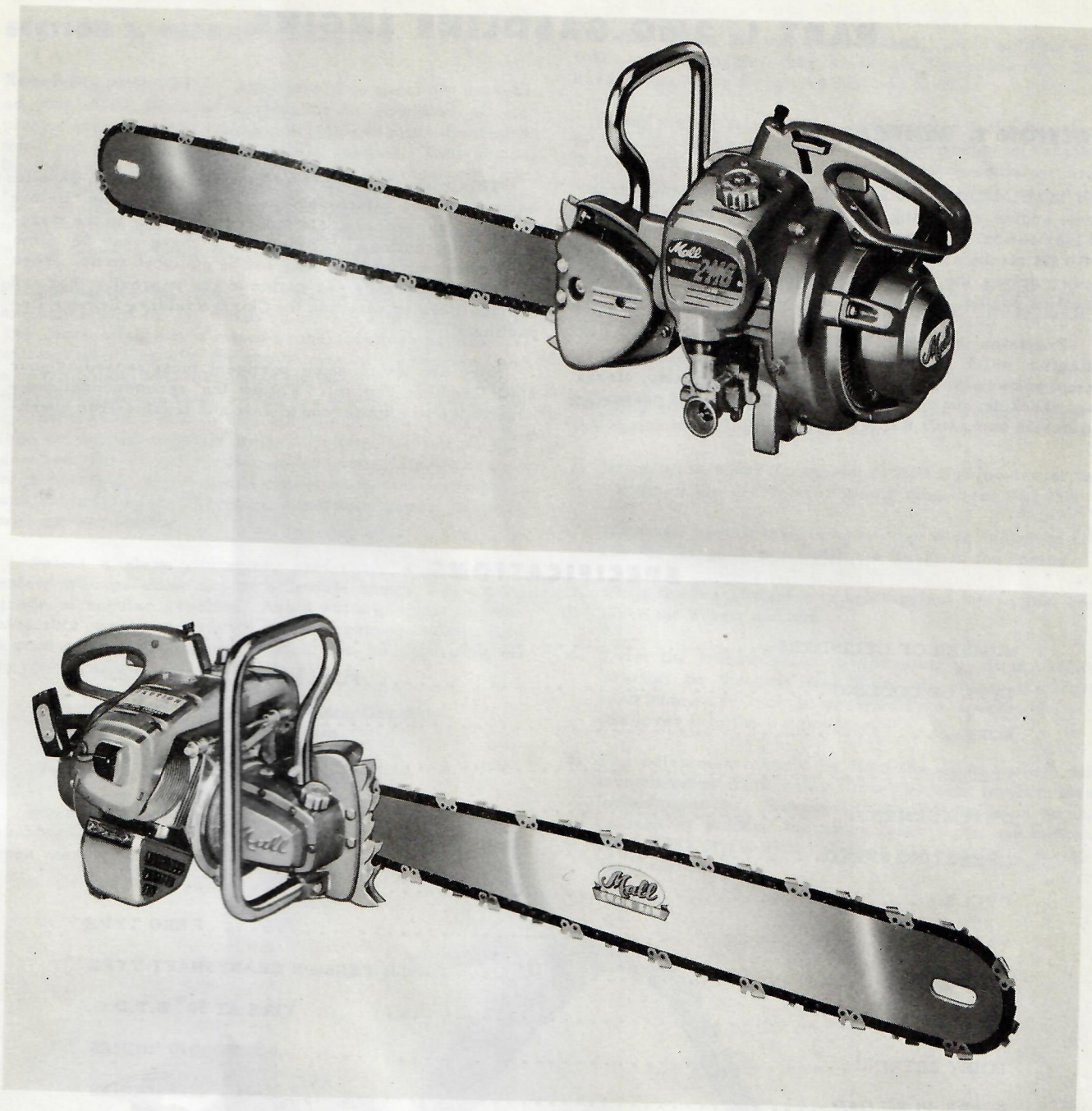


FIG. 1

## INTRODUCTION

The MALL Model 2MG Gasoline Engine represents the latest and most advanced development in portable gasoline engine design manufactured by the MALL TOOL COMPANY today. Information collected over years of successful gasoline engine manufacturing has helped in the development of the 2MG. It is powerful, light in weight, and will deliver more service hours per dollar than any previous model on the market.

The instructions presented here are to assist the owner to obtain the most efficient and longest service with the least maintenance-cost-operation of his MALL MODEL 2MG. The gasoline engine is built under precision methods. By carefully following the directions presented here you will be assured of long trouble-free service.



# PART I. 2MG GASOLINE ENGINE

## SECTION 1. GENERAL

The MALL MODEL 2MG Gasoline Engine is a two-stroke cycle engine employing the "oil-mixed-gasoline" method of lubrication. Every "down-stroke" of the piston is a POWER stroke and at the designed RPM a smooth flow of power drives the various attachments available for this gasoline engine.

Precision high speed engines require the care and attention which a proud owner will want to give. It is sound business too, for doing things the right way, cleaning, checking, and operating your 2MG engine as prescribed in this book, will REDUCE operating costs.

This manual is divided into two parts; the gasoline engine and the attachments. Carefully read the "Before Starting" procedures, and adhere faithfully to the maintenance suggestions. Remember, there may be some types of repair jobs you may not be equipped to do. When in doubt, send your gas engine to the nearest authorized service store or direct to the Chicago factory Service Department.

Here are listed some pertinent facts regarding your 2MG Gasoline Engine. Follow the recommendations - substitutes are dangerous to safe and trouble-free operation.

## SPECIFICATIONS

NUMBER OF CYLINDERS . . . . .	ONE
TYPE OF COOLING . . . . .	FORCED AIR CIRCULATION
BORE . . . . .	.225 INCHES
STROKE . . . . .	1.625 INCHES
DISPLACEMENT . . . . .	6.45 CU. IN.
OPERATING SPEED . . . . .	5000 RPM
CYCLE . . . . .	TWO
VALVE . . . . .	REED TYPE
MAGNETO . . . . .	HIGH TENSION CRANKSHAFT TYPE
IGNITION TIMING . . . . .	FIRE AT 30° B.T.D.C.
POINT SETTING . . . . .	.018 TO .020 INCHES
SPARK PLUG GAP . . . . .	.025 INCHES
TYPE OF SPARK PLUG . . . . .	CHAMPION J6
TYPE OF BEARINGS . . . . .	BALL, ROLLER, AND NEEDLE BEARINGS
TYPE OF CARBURETOR . . . . .	FLOAT TYPE
TYPE OF STARTER . . . . .	ROPE REWIND
CYLINDER . . . . .	POROUS CHROME
FUEL TANK CAPACITY . . . . .	2-3/4 PINTS
FUEL RATIO . . . . .	3/4 PINT SAE NON-DETERGENT OIL TO 1 GALLON GASOLINE
RECOMMENDED GASOLINE GRADE . . . . .	72 TO 84 OCTANE RATING
RECOMMENDED OIL GRADE . . . . .	SAE 30 NON-DETERGENT



## SECTION 2. BEFORE STARTING

**Receiving package.** After you have carefully uncrated your 2MG gasoline engine, make sure that all the pieces are included. Do not attempt to start the engine until you are acquainted with this manual. Your engine has been test run at the factory before shipment and is in proper adjustment. If there are any parts missing from the container, report it to your carrier and to MALL TOOL COMPANY Traffic Department. Immediate steps will be taken to locate the missing parts.

**Preparing the fuel mix.** Two stroke cycle engines are lubricated by oil which is mixed with the gasoline. The lubricating oil, if mixed in the recommended ratios, will not interfere with the combustion of the gasoline, and a cool running, well lubricated engine will result. Only if improper gasoline-to-oil ratios are used will there be any difficulty experienced with hot-running, burned-out bearings or scored cylinder walls. Too much oil in the oil-gasoline mix is not recommended since this will cause hard starting, stuck piston rings, carboned spark plugs and exhaust ports; therefore maximum power delivery will not be possible.

Select a clean container, preferably a five gallon safety type gasoline can with flexible spout. Use a good grade of regular gasoline. Avoid white gasoline or benzine; this engine is designed to use regular gasoline. Add a good grade non-detergent S.A.E. No. 30 lubricating oil to your gasoline in the following ratios:

S.A.E. 30 Oil		72 Octane Gasoline
3/4 pint	to	1 gallon
1-1/2 pint	to	2 gallons
1-1/2 quarts	to	4 gallons

When oil is poured into the gasoline, mix well by shaking the container vigorously, or if the mix is in an open vessel, stir with a clean stick.

When filling the tank of your 2MG, avoid spilling any fuel over the engine; this is not only dangerous as a fire hazard, but tends to collect dust and dirt.

Keep your gas tank full. Condensation inside the tank is a source of trouble which can be eliminated by keeping the tank full. Store your gasoline supply container in a safe place, and keep the spout and the filler hole capped.

**CAUTION:** NEVER RUN THE ENGINE WITHOUT A TRANSMISSION ATTACHED. THIS WILL CAUSE DAMAGE TO THE CLUTCH MECHANISM.

**Connect transmission.** Connect the transmission to the engine by following these steps:

1. Remove the 42488 Screw and 118303 Nut located at the bottom of the 41155 Index clamp ring. (see fig. 2).
2. This will permit the clamp to open wide enough to allow the flange to meet with the flange of the engine.
3. While the transmission is held against the engine, replace the screw and nut.
4. Twist the transmission to operating position, 35687 Bracket on the left hand side, oil cap on the right hand side, and lock in position by releasing the index lever into the UP position.
5. The adjustment should be tight enough to prevent the transmission from being turned by hand while in this locked position. However, if the transmission turns, release by pushing the index lever down and tighten the 118303 Nut a little. Repeat this method of checking if necessary.

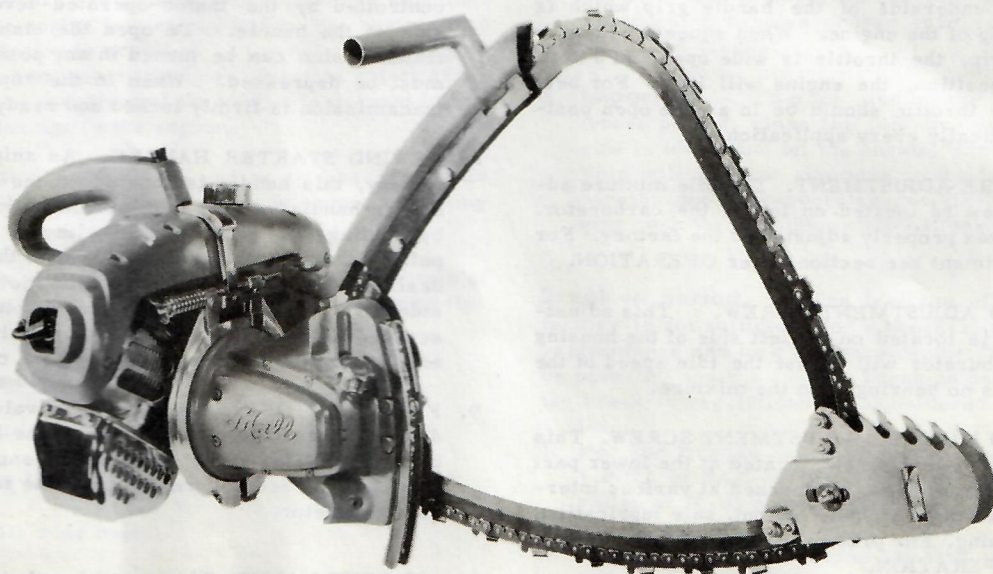


FIG. 2



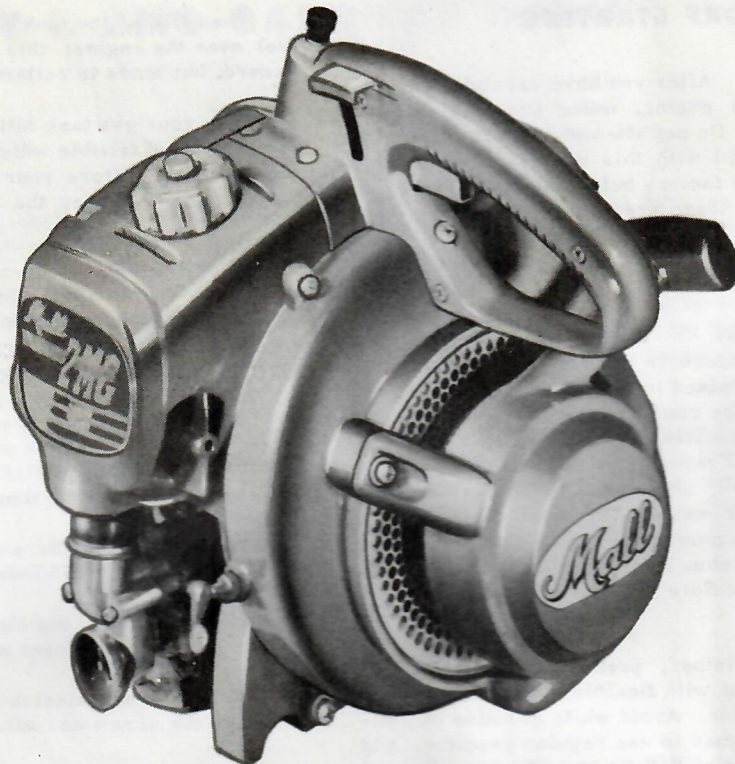


FIG. 3

**Location of controls.** Before applying a 2MG gasoline engine to a job, the operator should familiarize himself with the controls. All controls for normal operation are easily reached. Refer to Fig. 3 for illustrations.

1. **THROTTLE CONTROL.** The throttle control is located on the underside of the handle grip which is located on top of the engine. When squeezed flush to the handle grip, the throttle is wide open. In a normal trigger position, the engine will idle. For best operation the throttle should be in a wide open position for practically every application.
2. **IDLE MIXTURE ADJUSTMENT.** The idle mixture adjustment screw is located on top of the carburetor. This screw was properly adjusted at the factory. For further adjustment see section under OPERATION.
3. **IDLE SPEED ADJUSTMENT SCREW.** This adjustment, which is located on the left side of the housing near the carburetor will adjust the idle speed of the engine. It has no bearing upon the mixture.
4. **HIGH SPEED MIXTURE ADJUSTMENT SCREW.** This important adjustment screw, located at the lower part of the carburetor, must be checked at various intervals to assure highest power output, safe lubrication, and cool running. For proper adjustment see the section under OPERATION.
5. **CHOKE LEVER.** This lever is located on the operator-side of the carburetor. It is a flat lever which protrudes from the side of the carburetor and can be operated by thumb or forefinger.
6. **IGNITION SWITCH.** This button is an ON and OFF switch and must be in the ON position before the engine can be started. The ON position is the "pulled out" position. The off position is the "in" position.
7. **INDEXING LEVER.** The clamping ring, which holds the transmission in position against the engine, is controlled by the thumb-operated lever on the left side of the handle. To open the clamp ring so the transmission can be turned in any position, the lever must be depressed. When in the "up" position, the transmission is firmly locked and ready to operate.
8. **REWIND STARTER HANDLE.** As shipped from the factory, this handle is located on the left side of the center handle. This is to permit starting the engine by holding the center handle with the right hand and pulling the starter rewind rope with the left hand. If desired, the starter handle can be moved to the right side of the center handle by removing the three 101170 screws which hold the starter assembly to the engine and turning the starter assembly 120° clockwise.
9. **FUEL SHUT OFF VALVE.** This valve is located directly under the gasoline tank to the left of the carburetor. After using the gasoline engine, this valve should be closed to prevent gasoline from settling in the carburetor.
10. **AIR VENT VALVE.** This small knurled knob is located in the center of the gasoline cap. During operation this vent must be open. To open unscrew two complete turns. After shut down, this valve should be closed by turning clockwise until firmly seated.



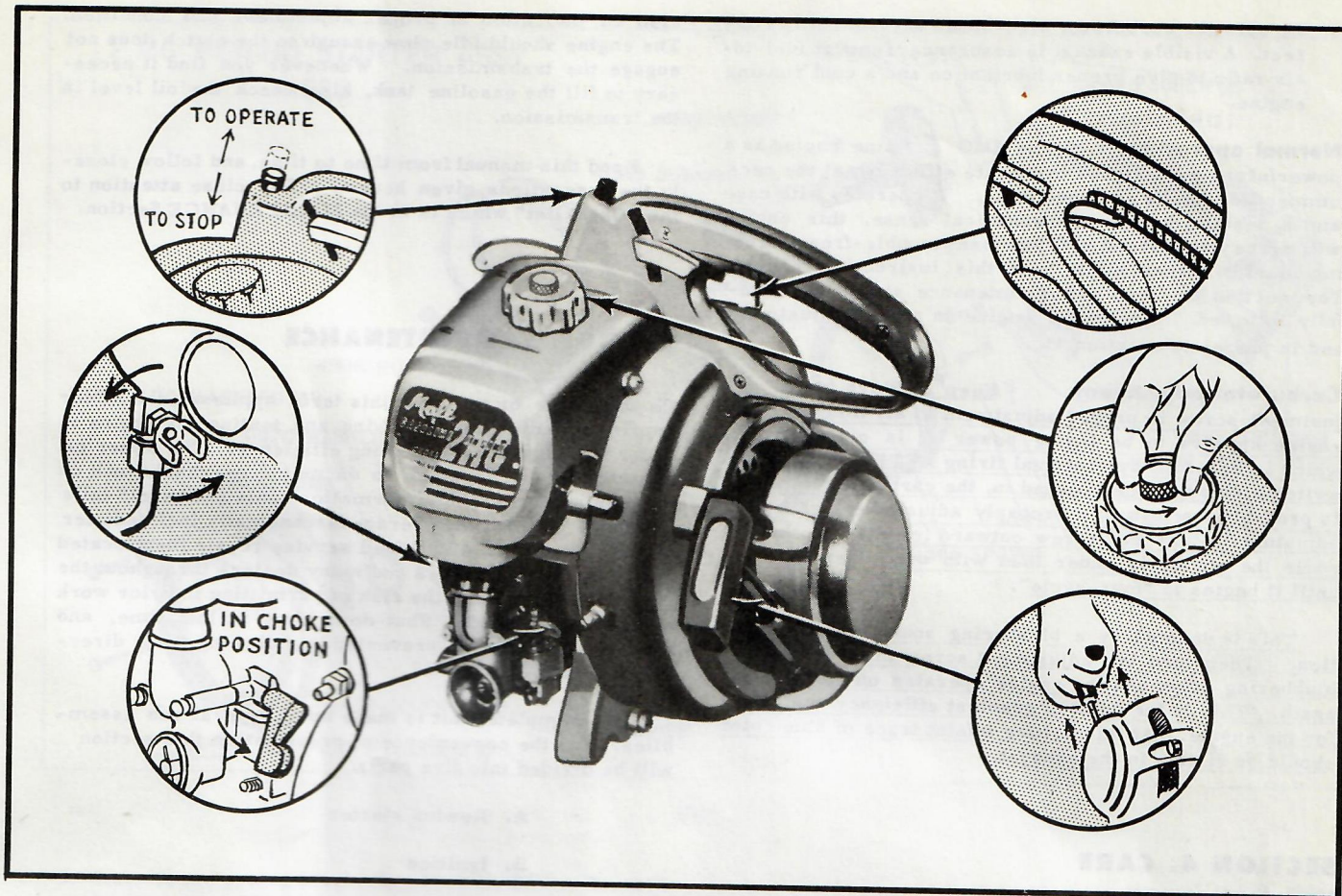


FIG. 4

### SECTION 3. OPERATION

**Safety precaution.** Before operating this engine be sure there is no liquid gasoline near or on engine. Wipe the engine dry and cover any containers of gasoline. Do not operate engine in a closed room. Be certain that plenty of ventilation is provided. Do not run the engine without the transmission attached. Practice safety at all times during the operation of the engine to prevent injury to person or damage to the engine.

**Starting procedure.** The engine has been test run at the factory before shipment and is in proper operating adjustment.

With the gasoline tank filled with the proper mix of fuel, follow these steps to start the engine: (Refer to figure 4)

1. Loosen gas cap vent.
2. Open fuel line valve.
3. Close choke lever.
4. Open throttle wide open.
5. Open ignition switch by pulling button OUT.
6. Grasp starter rope handle firmly and pull out slowly until compression is felt. Then jerk sharply. Repeat

at least until the engine fires. Then, open the choke lever and repeat. As soon as the engine starts release the throttle so the engine may idle for a moment.

7. Be sure that a slight bluish color appears in the exhaust which denotes proper carburetor setting. Adjust if not visible.
8. **Important.** Before storing the engine for an extended period, close the fuel line valve while the engine is idling and let the engine "run-out" of gasoline. This will prevent gumming in the fuel lines and carburetor due to evaporated gasoline. To stop the engine push the ignition switch button.

**Break-in period.** The test run of the engine at the factory is not sufficient for a break-in period. For best performance and long life service, the 2MG engine should be operated under a 20 hour break-in period. The following break-in regulations are considered sufficient:

1. For the first 20 hours of operation, use a fuel mix of 1 PINT of SAE 30 non-detergent lubrication oil to 1 gallon of 72-85 octane gasoline.
2. Do not operate the engine for long periods of time at full speed under full load.
3. Do not permit the engine to run at full speed under no load.



4. Be sure the carburetor high-speed adjustment is correct. A visible exhaust is assurance of enough fuel-to-air ratio to give proper lubrication and a cool running engine.

**Normal operation.** The 2MG gasoline engine is a powerful engine designed to operate efficiently at the recommended speeds and conditions. If operated with care and a certain degree of mechanical sense, this engine will serve you well and give you many trouble-free operating hours. Occasionally read this instruction manual. The section on care and maintenance should be carefully followed. Keep your engine in proper adjustment and in proper lubrication.

**Carburetor adjustment.** Keep the high speed adjustment screw in proper adjustment at all times. If the engine appears to be losing power or is over-heating, which is detected by continual firing AFTER the ignition switch button has been pushed in, the carburetor mixture is probably too lean. To properly adjust the high speed adjustment, turn the screw outward (counter clockwise) while the engine is under load with wide open throttle, until it begins to "four-cycle".

This is denoted by a blubbering sound during operation. Then turn the adjustment screw inward until this blubbering stops and the engine operates on "two-cycle" again. This is the point of greatest efficiency and safety for the engine. At this setting a faint trace of blue color should be visible in the exhaust.

## SECTION 4. CARE

The following suggestions for the care of your gasoline engine will assist in giving you many trouble-free hours of operation at the least possible maintenance cost. By observing these suggestions you always have a powerful engine ready for operation.

During operation, the operator should always be aware of any new or unfamiliar changes not normal to a properly running engine. These "warnings" may come as new sounds, odors, or actual performance differences in the engine. Immediately check the cause of these uncommon changes. Costly repair or replacements of parts may be avoided by being alert.

When engine operation has been stopped for some period, such as after a day's work, it is advisable to check and fill the fuel tank. Also check other lubricating points so the engine will be ready for operation at the start of a job.

It is advisable to clean the engine before storing. While wiping off various parts, a visual check can be made. Control linkage should be secure and external fasteners checked for tightness. Cooling fins around the cylinder and the air intake screen should be checked for possible clogging by leaves or sawdust which would interfere with the cooling air circulation.

During operation you should continuously watch the exhaust; be sure that there is a little color present to show that proper carburetor adjustment is made. Also occasionally check the automatic chain oiler to see that oil is being pumped into the chain at a rate to assure proper lubrication. The smoothness of running idle is

also an indication of proper adjustment and condition. The engine should idle slow enough so the clutch does not engage the transmission. Whenever you find it necessary to fill the gasoline tank, also check the oil level in the transmission.

Read this manual from time to time, and follow closely the suggestions given herein. Pay close attention to the "Checklist" which is in the MAINTENANCE Section.

## SECTION 5. MAINTENANCE

To the owner or operator this term applies to the minor repairing, adjusting, checking and testing the engine in order to maintain top operating efficiency. The owner or operator is not expected to do major overhaul work on this equipment, and the information contained herein falls within the scope of the average mechanically inclined user only. There are authorized service repair men located at MALL Branch Offices and many dealers throughout the country. Don't take the risk of permitting inferior work on your equipment. Shut-down time is lost time, and much of this can be prevented by following these directions on MAINTENANCE.

The complete unit is made up of several sub assemblies. For the convenience of presentation this section will be divided into five parts:

- A. Rewind starter
- B. Ignition
- C. Fuel
- D. Clutch
- E. Cylinder

As the type of transmission is different with each application of the gasoline engine, information will be found under the section concerning that particular attachment.

**Rewind starter.** The 2MG rewind starter is a simple, sturdy, positive-starting mechanism. On former MALL gasoline engines it was suggested that the rewind starter rope be pulled out a short way when stopping to prevent a "kick-back" on the rewind mechanism. This is not necessary on the 2MG rewind starter. **DO NOT PULL OUT STARTER REWIND ROPE WHILE THE ENGINE IS RUNNING.** This may cause serious damage to the mechanism. The exploded view below will provide all the necessary information to assist in the complete disassembly of this part. Parts should be ordered by the part number shown identifying that part.

Also refer to this exploded view when following the step by step procedures outlined below. Refer to Fig. 5.

### To Replace the Rewind Starter Rope

1. Remove the Rewind starter assembly by removing the three screws which hold it to the engine housing.
2. Remove the 42460 Cover by removing the three 101170 Screws.



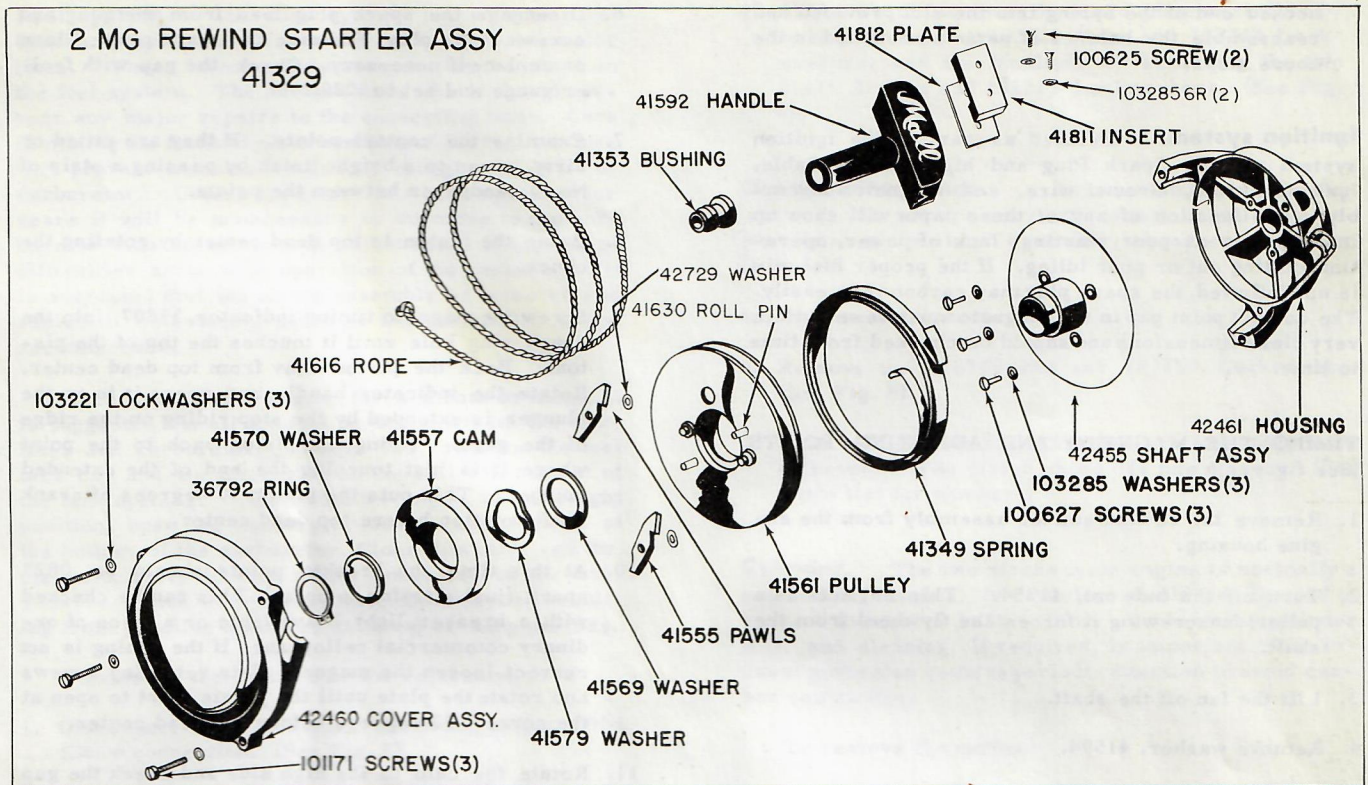


FIG. 5

3. Release the spring tension by carefully lifting the rope handle and 41353 Bushing out of recess and permit the pulley to unwind until there is no tension.
  4. With needlepoint pliers remove 36792 Ring.
  5. Remove the 41570 Washer.
  6. Lift the 41557 Cam off the shaft.
  7. Lift the two 41555 Pawls from their pivots taking careful note of their position so they can be replaced correctly.
  8. Lift off the two 42729 Wave Washers.
  9. Lift out the 41579 Washer.
  10. Next lift out the 41569 Washer.
  11. This will permit the 41561 Pulley to be lifted out.
  12. Force the 41630 Roll Pins through to the opposite side of Pulley.
  13. To install a new rope, thread the end of the new rope under the pin which is located in the pulley groove near the center hub. Guide the rope end through the hole in the side of the pulley and knot the end of the rope. Carefully pack the knot into the hole so the rope is flush with the sides of the pulley.
  14. Wind the rope clockwise around the pulley while holding the Pulley with the raised portion of the hub facing upward.
  15. Thread the replacement rope through the Bushing and fasten to handle.
  16. When re-assembling be sure the Pulley engages the spring hook. This can be checked by feeling the tension by hand.
  17. Force the 41630 Roll Pins to the spring side of pulley.
  18. Replace the remaining parts in reverse order of disassembly. NOTE: Place tension upon the Pulley before securing the 42460 Cover by turning the Pulley, which is engaged with the rewind Spring, two complete turns counterclockwise. To take up the rope slack, wrap it around onto the Pulley.
  19. Replace and secure the Cover over the Pulley.
  20. Mount the assembly onto the engine.
- To Replace Rewind Spring**
1. Repeat the first ten steps of the preceding outline.
  2. Carefully remove the Spring from the housing.
- NOTE:** Great care should be used during this operation to prevent the Spring from flying apart and endangering the repairman. Hold the housing firmly in one hand and unreel the Spring very slowly.
3. Install the replacement Spring into the recess before removing the packing ring which holds the new Spring in a coiled up position. Engage the outside



hooked end of the Spring into the slot provided and reassemble the balance of parts as outlined in the above steps.

**Ignition system.** Included as part of the ignition system are the Spark Plug and high tension Cable, Ignition switch, Ground wire, and Magneto assembly. Malfunction of any of these parts will show up immediately as poor starting, lack of power, operation cutting out or poor idling. If the proper fuel mix is not followed, the spark plug may carbon very easily. The contact point gap in the magneto must be set within very close dimensions and should be checked from time to time.

**TIMING THE MAGNETO AND ADJUSTING POINTS**  
(See figures 6 and 7)

1. Remove the rewind starter assembly from the engine housing.
2. Turn off the hub nut, 41354. This nut acts as a puller; unscrewing it forces the flywheel from the shaft.
3. Lift the fan off the shaft.
4. Remove washer, 41594.
5. Remove the two screws, 101168, and lift off the breaker point cover, 41321.

6. Disengage the spark plug lead from the plug and screw out the plug. Examine the spark plug. Clean or replace if necessary. Check the gap with feeler gauge and set to .020.
7. Examine the contact points. If they are pitted or dirty, clean to a bright finish by passing a strip of No. 0 sandpaper between the points.
8. Bring the piston to top dead center by rotating the chuck.
9. Screw the magneto timing indicator, 35807, into the spark plug hole until it touches the top of the piston. Back the piston away from top dead center. Rotate the indicator handle and press it in so the plunger is extended by the stop riding on the ridge of the gage. Bring the piston back to the point where it is just touching the end of the extended plunger. This puts the piston 30 degrees of crank shaft rotation before top dead center.
10. At this time the breaker points should be .002" apart, (just starting to open.) This can be checked with a breaker light if available or a piece of ordinary commercial cellophane. If the timing is not correct, loosen the magneto plate retaining screws and rotate the plate until the points start to open at the correct 30 degrees before top dead center.
11. Rotate the cam to the high side and check the gap between the points with a feeler gage. The opening should be .020" to .022". If the maximum gap is not correct, adjust with the set screw.

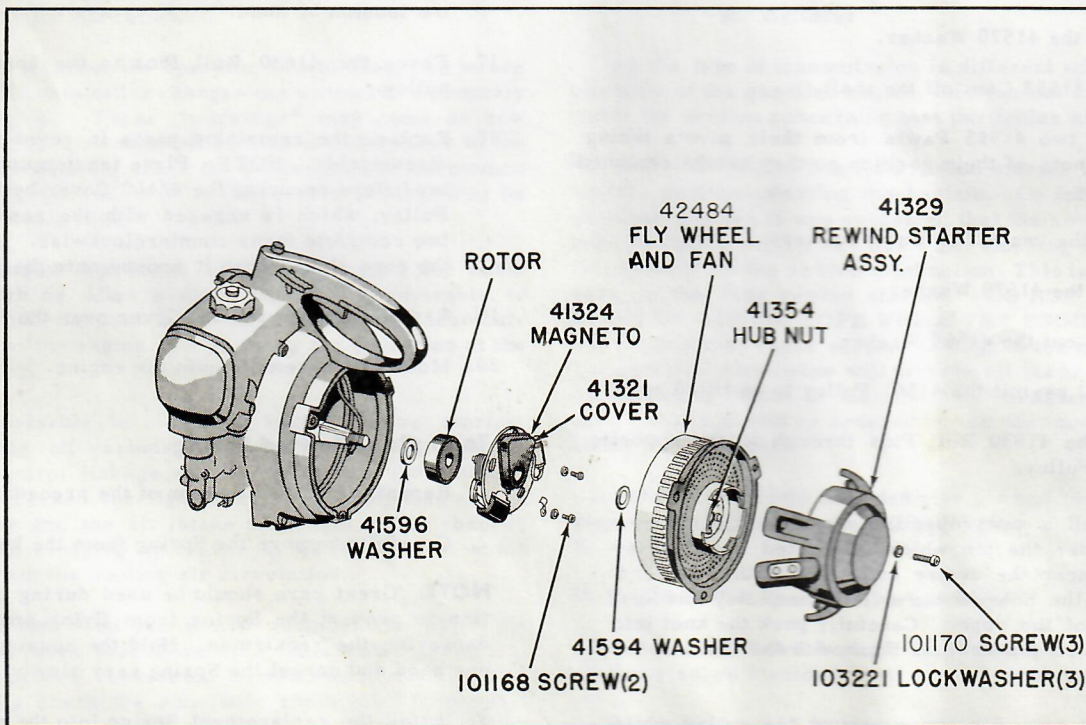


FIG. 6



**Fuel system.** The fuel system includes the fuel tank and carburetor assembly with the connecting lines. There is very little maintenance required on the fuel system. The advised daily check should prevent any major repairs to the connecting lines. Care in mixing the fuel and clean handling of the fuel mixture will prevent troubles caused by clogging of lines or carburetor. Unless the engine has been operated for years it will be unnecessary to do more to the carburetor than an occasional adjustment. If any major difficulties arise with operation of the carburetor, it is suggested that the entire assembly be removed and replaced. Replacing parts of the carburetor is not recommended.

When storing the engine for a month or more, it is suggested that all the fuel be drained from the tank, lines and carburetor. To do this, remove the fuel tank cap and tip the engine so the fuel will run out of the tank opening. Next, with the engine in an upright position, open the carburetor drain valve located at the bottom of the carburetor. Close this valve and the fuel tank valve located at the underside of the tank. This precaution will prevent the gummy deposit resulting from gasoline mixtures standing for long periods.

To remove the carburetor for replacement:

1. Disconnect the 37062 Line assembly at the 40004 Elbow connection. (See Fig. 8)
2. It is necessary to remove the 40894 Reed plate assembly, (See Fig. 8), on which the carburetor is mounted. Before removing the 101167 Screws and 103221 Lockwashers which hold the Plate to the engine, be sure to uncouple the 42323 Lever. (See Fig. 8).
3. By removing the four 101167 Screws and 103221 Lockwashers, the Carburetor, Reed plate assembly and 40899 Manifold can be removed from the engine.

4. At the bench remove the Reed plate assembly by removing the two 103028 Nuts and 103247 Lockwashers; and the Manifold by removing the two 21475 Screws and 103213 Lockwashers. (See Fig. 8).

**Clutch maintenance.** As the clutch is fully automatic, it will require very little maintenance. The replacement of the clutch assembly, whenever necessary is simple.

1. Remove the transmission.
2. Remove the 118349 Nut and 103253 Lockwasher. (See Fig. 8).
3. This will permit the 37533A Clutch assembly to be removed. The clutch shoes can be replaced. (See parts list for number.)

**Cylinder.** The two stroke cycle engine is normally a hot running engine, but caution should be exerted to prevent excessive heat. Daily check of the cylinder fins, and cleaning, if required, is important. The exhaust ports also require periodic attention to avoid carbon restriction.

To remove the carbon:

1. Remove 18721 Wire, 18879 Screws and 103204 Lockwashers.
2. Remove the 21949A Muffler. This will expose the exhaust ports. At this point the piston should be positioned at bottom dead center by use of the starter rope. Using a blunt pointed tool, scrape the carbon that has collected at the port. Blow away remaining particles and reassemble.

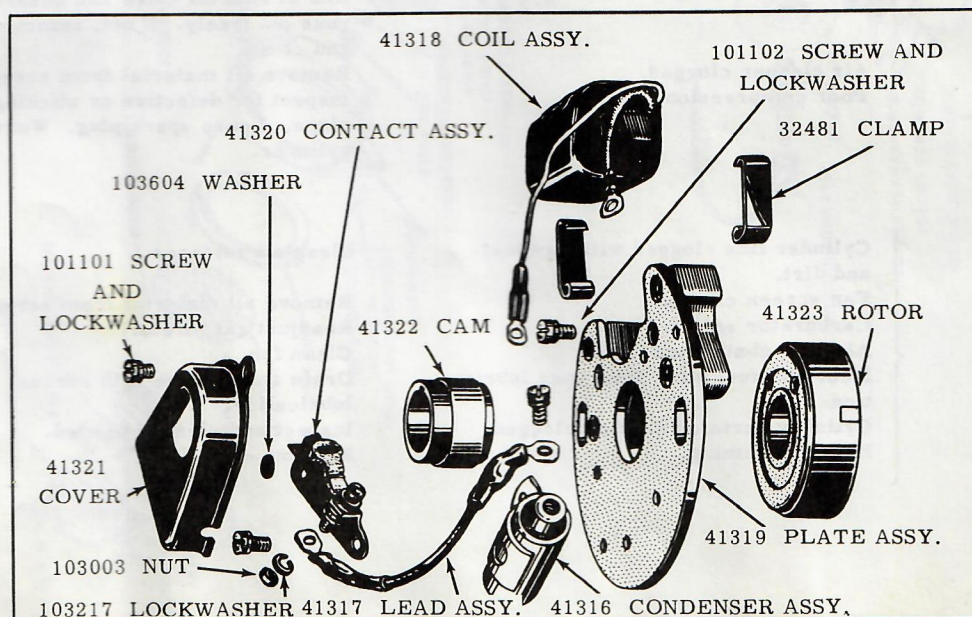


FIG. 7



## SECTION 6. TROUBLE SHOOTING

TROUBLE	PROBABLE CAUSE	REMEDY
Engine fails to start.	<ul style="list-style-type: none"> <li>No fuel.</li> <li>Fuel shut off valve closed.</li> <li>Gas cap air vent screw closed.</li> <li>Water or dirt in fuel.</li> <li>Fuel strainer dirty.</li> <li>Spark plug defective or wet.</li> </ul> <p>Engine flooded.</p> <p>Foreign material in reed plate.</p> <p>Defective ignition system.</p>	<ul style="list-style-type: none"> <li>Refill fuel tank with correct mixture.</li> <li>Open valve.</li> <li>Open air vent screw.</li> <li>Drain and clean fuel tank, lines and carburetor.</li> <li>Remove spark plug for inspection, dry and clean and replace.</li> <li>Shut off fuel valve. Crank engine several times. Open fuel valve and start</li> <li>Remove plate and clean.</li> <li>Inspect ignition wiring for loose or damaged wires and connections and replace or adjust points.</li> </ul>
Engine lacks power.	<ul style="list-style-type: none"> <li>Defective or fouled spark plugs.</li> <li>Excessive carbon deposits in exhaust ports.</li> <li>Carburetor or linkage out of repair.</li> <li>Incorrect fuel mix. Excess oil.</li> <li>Improper timing.</li> <li>Worn or sticking piston rings.</li> <li>Muffler clogged.</li> <li>Air filter clogged.</li> </ul>	<ul style="list-style-type: none"> <li>Remove and inspect. Replace or clean as required.</li> <li>Inspect exhaust ports for carbon and remove.</li> <li>Readjust carburetor and repair linkage.</li> <li>Drain and replace with correct fuel mix.</li> <li>Re-time--see timing adjustments.</li> <li>Remove and replace.</li> <li>Remove and clean.</li> <li>Remove and clean.</li> </ul>
Engine hard to start.	<ul style="list-style-type: none"> <li>Spark plug defective or fouled.</li> <li>Carburetor out of adjustment.</li> <li>Improper mixture of fuel.</li> </ul> <p>Defective ignition system.</p> <ul style="list-style-type: none"> <li>Excessive carbon deposits in engine.</li> <li>Fuel lines obstructed.</li> </ul> <p>Air cleaner clogged.</p> <p>Poor compression.</p>	<ul style="list-style-type: none"> <li>Replace or clean spark plug.</li> <li>Readjust carburetor.</li> <li>Drain fuel tank, fuel lines and carburetor.</li> <li>Replace with correct fuel mixture.</li> <li>Inspect ignition system for loose connections or worn wires.</li> <li>Clean out exhaust ports.</li> <li>Close fuel shut off valve. Disconnect fuel line at shut off valve and observe if fuel runs out freely. If not, remove fuel line and clean.</li> <li>Remove all material from screen.</li> <li>Inspect for defective or sticking piston rings. Loose spark plug. Worn or scored cylinder.</li> </ul>
Engine overheats.	<ul style="list-style-type: none"> <li>Cylinder fins clogged with sawdust and dirt.</li> <li>Fan screen clogged.</li> <li>Carburetor set too lean.</li> <li>Air flow obstructed.</li> <li>Incorrect fuel mix. Improper lubrication.</li> <li>Cylinder ports or muffler clogged.</li> <li>Improper timing.</li> </ul>	<ul style="list-style-type: none"> <li>Clean all surfaces.</li> <li>Remove all material from screen.</li> <li>Readjust carburetor.</li> <li>Clean fan.</li> <li>Drain and replace with correct fuel or lubrication.</li> <li>Inspect and clean if needed.</li> <li>Re-time engine.</li> </ul>







**PINCHLESS  
TRANSMISSION  
ASSY N° 40910 P**

CAP	GUIDE	CHAIN
14"	4190	40771C
18"	40940	40782C

**CHAINSAW  
TRANSMISSION  
ASSY N° 40910**

CAP	GUIDE	CHAIN
18"	40520	40780 C
24"	40521	40781 C
30"	40522	40782 C
42"	40523	40783 C
54"	40933	40784 C
36"	41792	41795

**CHAINSAW  
TRANSMISSION  
ASSY. N° 40860**

CAP	GUIDE	CHAIN
30"	40522	40801C
36"	40792	41796
42"	40523	40811G
54"	40933	40812C

**BOWSAW**

CAP	BOW (CHAIN INCL.)
18"	41760
24"	41761

**GRINDING  
TRANSMISSION  
ASSY N° 41710**

LENGTH	FLEXIBLE SHAFT	SHAFT HOUSING
7 FT.	32984 B	36682 B
14 FT.	32984 C	36682 C

**DRY ANGLE SPINDLES**

SPEED	PART N°
FULL	30811 B
HALF	30812 B
THIRD	30813 B
QUARTER	30814 B

**WET ANGLE SPINDLE**

FULL	31151 B
HALF	31152 B
THIRD	31153 B
QUARTER	31154 B
TENTH	9910 B

**STRAIGHT SPINDLES**  
6310-B-38840B  
WITH COLLET 2403 B  
FOR DRILLING USE  
CHUCK N° 2018 A

**EARTH AUGER  
TRANSMISSION  
ASSY N° 41400**

DIA.	AUGER BIT
6"	40375
9"	40374
12"	40795

**2 MG  
GASOLINE  
ENGINE  
ASSY N°  
40890**

**CONCRETE VIBRATOR  
RIGHT ANGLE TRANSMISSION  
\* ASSY N° 41720**

LENGTH	FLEXIBLE SHAFT	SHAFT HOUSING
2 FT.	35814 B	36920 SHORT COUPLED
7 FT.	35814	21070
14 FT.	35814 A	21070 A

USE VIBRATOR HEAD V23  
COUPLING 35820

ALSO AVAILABLE ARE  
V17 VIBRATOR HEAD 1 3/4 DIA.  
V32 VIBRATOR HEAD 3 1/4 DIA.

\* DOUBLE ENGINE SPEED  
DO NOT USE FOR GRINDING

**SUMP PUMP  
TRANSMISSION  
ASSY N° 41710**

SUMP PUMP ASSY I1570B  
FLEXIBLE SHAFT 32984C  
FLEXIBLE SHAFT HOUSING-  
-36682 C 14 FOOT LENGTH

**WOOD DRILL  
DIRECT DRIVE  
TRANS N° 41710**

CHUCK ASSY  
N° 50673



## PART II. ATTACHMENTS

With the various attachments available the 2MG gasoline engine becomes the most versatile power unit on the market. A complete working assembly includes (1) the engine, (2) the transmission and (3) the attachment. The type of attachment to be used with the 2MG gasoline engine will determine the type of transmission needed. As each attachment is described in the following sections, the type of transmission will also be described with maintenance suggestions included. Each section will deal with an attachment and the variations thereof.

### SECTION 1. CHAIN SAW

One of the most popular applications of the powerful 2MG gasoline engine is as a portable chain saw. Various styles adapt the chain saw to one or two man use. Designed to their particular requirements, the Pinchless and the Bow saw are also available.

**Transmission.** The transmission is the intermediate unit between the engine and the attachment. It provides a means of transmitting the power delivered by the engine to the attachment at the most desirable speed in a convenient position for operation. The chain saw assembly using the straight guides requires the 40910 die cast transmission with automatic oiler.

This new development in chain oiling permits continuous cutting operation, eliminating the danger of the chain running without lubrication. The amount of oil delivered by the automatic oiler can be regulated. The adjustment screw is located on the left side of the transmission. By turning the screw inward the rate of oil flow is increased. Turning the screw outward decreases the oil flow. Although proper adjustment is made at the factory, the oiler should be carefully watched to see that it is operating properly and to prevent clogging. The oil reservoir and fuel tank usually require refilling at the same time. Care should be taken to use clean oil. In the event the oiler should become clogged, due to foreign matter in the oil, it must be disassembled and cleaned. Follow these steps:

1. Drain the oil from reservoir.
2. Remove the cover 41818, (Fig. 13).
3. Remove the plunger 40914.
4. Blow compressed air through the center of the plunger.
5. Remove the sprocket 40714 by removing nut 118346, washer 103614, and washers (2) 22564.
6. Blow compressed air through the outlet hole between the sprocket teeth or gently ream with wire.
7. Remove the nut 103140, stop assembly 42743 including ball, from the center of the shaft.

8. Blow compressed air through the center of the shaft.
9. Remove ring gear by removing screws (4) 101167.
10. Lift out the gear exposing oil passages. Blow these out with compressed air.

#### To re-assemble:

1. Replace gear, carefully placing gasket in proper position to avoid damaging. Turn shaft while setting place.
2. Replace stop assembly. Adjust screw to protrude about 1/16-inch beyond the surface of the bracket.
3. Replace washer, sprocket, washer, small washer and nut.
4. Locate oil hole in the inside of the shaft and insert the plunger so the hole in the plunger lines up with the hole in the shaft.
5. Replace cover without damaging gasket.

The transmission should be checked for grease about every 50 operating hours. The 5212 grease plug is vented and if too much grease is placed into the housing it may bleed out at this point.

To mount the transmission to the engine, first it is necessary to remove the screw at the bottom of the ring. (See Fig. 13). Place the transmission in operating position against the clutch cover, and allow the indexing clamp ring to snap to a closed position. Test the holding power of the index clamp ring by trying to turn the transmission by hand. If it can be turned the clamp ring will need adjustment. There is an adjustment screw at the bottom of the ring which permits the ring to be tightened. Turn inward to tighten

CHAIN ADJUSTMENT SCREW 36584

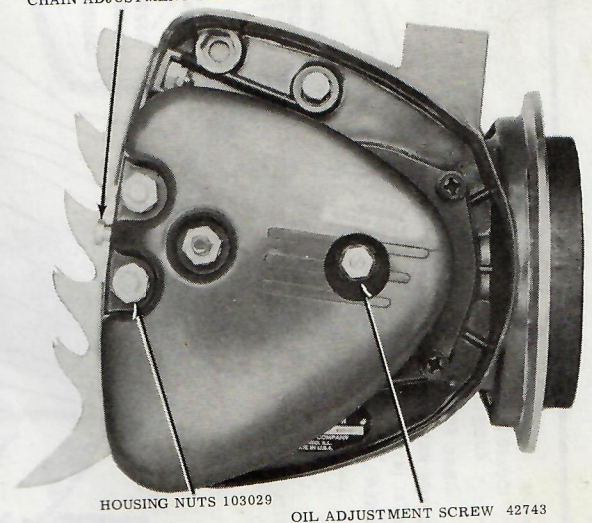
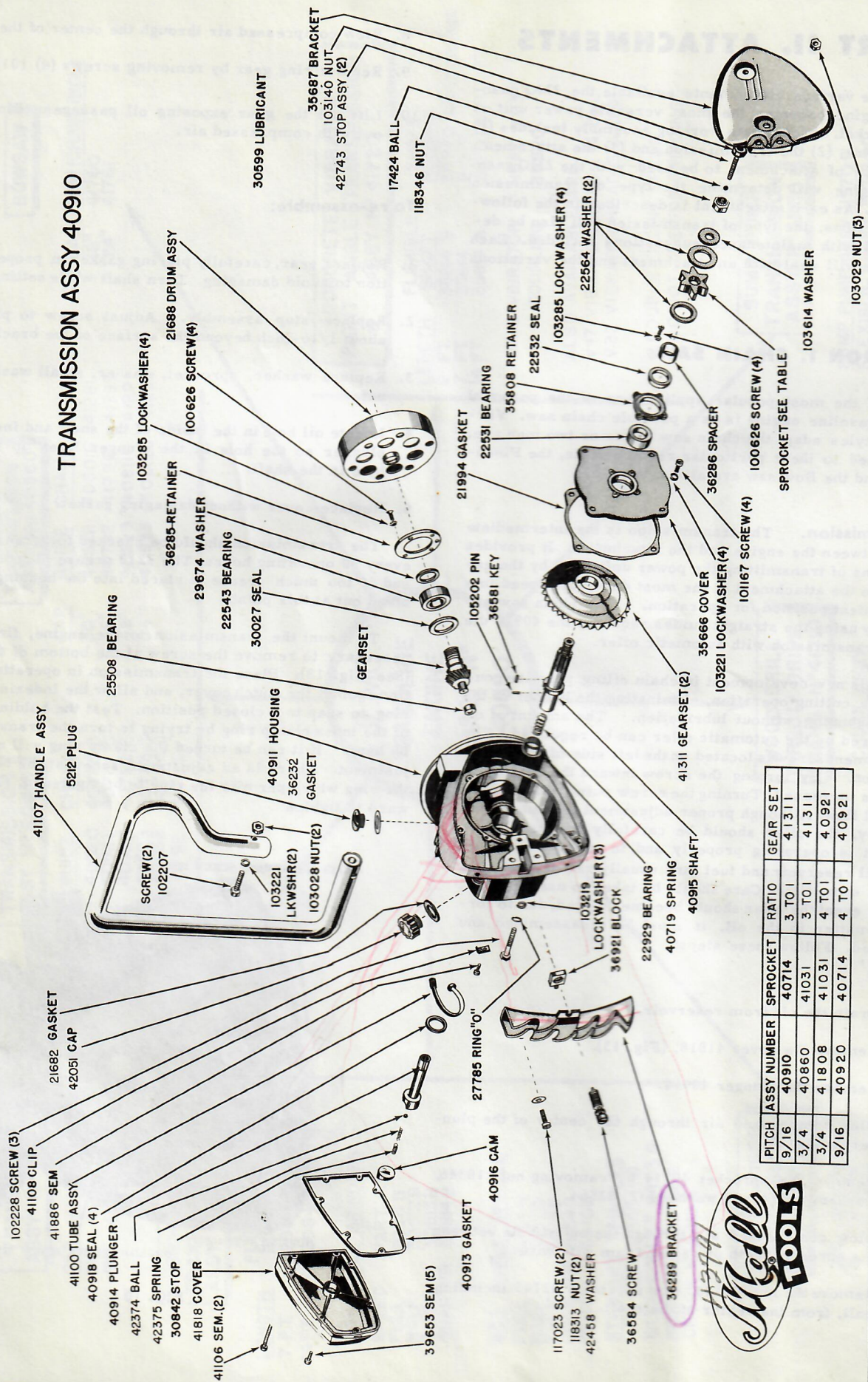


FIG. 10



40910P

# TRANSMISSION ASSY 40910



PITCH	ASSY NUMBER	SPROCKET	RATIO	GEAR SET
9/16	40910	40714	3 TO 1	41311
3/4	40860	41031	3 TO 1	41311
3/4	41808	41031	4 TO 1	40921
9/16	40920	40714	4 TO 1	40921



FIG. 11



### Straight guide.

The purpose of the guide is to provide a stable support for the chain during the cutting operation. The straight guide is made of a flat plate of specially heat-treated steel. It has a grooved edge in which the chain rides permitting stability and control of the cutting action. To make them applicable to many types of cutting requirements, guides are made in various capacities.

Capacity	Guide	Hard Faced Guide	Chain
18 inch	40520	42570	40780C
24 inch	40521	42571	40781C
30 inch	40522	42572	40782C
36 inch	41792	42573	41795C
42 inch	40523	42574	40783C
54 inch	40933	42575	40784C

There is very little maintenance to a chain saw guide. Care in the use of the chain saw during operation will eliminate most trouble. Keep the chain well lubricated and the wear of the guide will be kept to a minimum.

Straight guides which have received a special hardening treatment at the nose are available at a small additional cost. Our research has determined this special hard facing process results in greatly increased strength at the point of greatest wear and extends the useful life of the guide materially.

The guide is shipped in a separate package, and when received, it will have to be mounted onto the transmission. To mount the guide, first remove the 35687 Bracket. (See Fig. 10). This will permit the guide to be placed into position on the three bolts. Make sure the 42743 adjustment screw engages properly in the guide recess. Replace the 35687 Bracket. Do not tighten down the three holding bolts tight. Next turn in the adjustment screw. This is necessary in order to place the chain around the sprocket and into the guide groove when mounting the chain. Directions for mounting the chain will be found in the section on saw chains.

### Pinchless guide assembly.

The pinchless guide assembly is designed to provide an efficient "pinch-free" chain saw which is adaptable to many types of tree and lumber cutting. Due to the open space between the cutting chain and the returning chain a log or timber can not bind the chain during the cutting operation. (See Fig. 11).

The Pinchless chain saw is especially adaptable to the pulp wood industry, stump cutting and limbing. The sticker at the end of the guide permits cuts to be made from the underside of a limb. This is a great convenience prior to "bucking" a fallen tree.

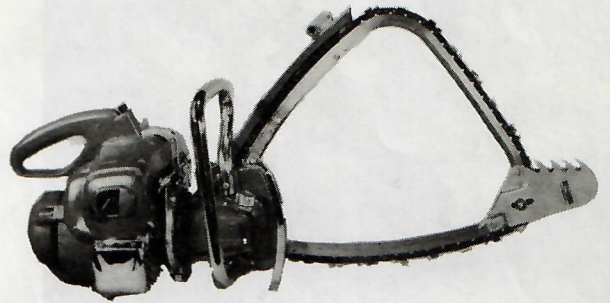


FIG. 12

The standard straight guide transmission 40910 can be converted to use the pinchless guides. It is only necessary to cut up a section which is clearly indicated by a recess on the top edge of the transmission. (See Fig. 12).

There are two capacities available.

Capacity	Guide	Chain
14 inch	41190	40771C
18 inch	40940	40782C

For proper chain tensioning see section under chain maintenance.

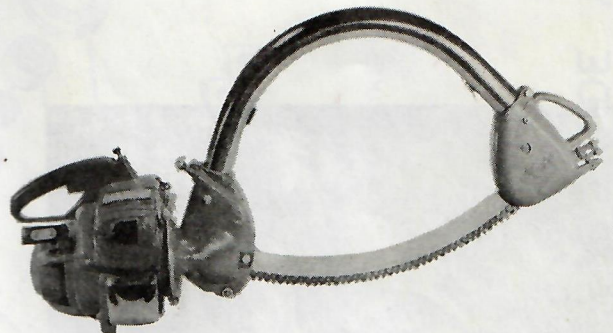


FIG. 13





CUTTING TEETH ON WEDGE-SHAPED GUIDE  
ARE NOT JAMMED BY PINCHING CONDITION.

CHAIN RUNNING OUT OF CUT  
IS NOT JAMMED BY PINCHING LOG.

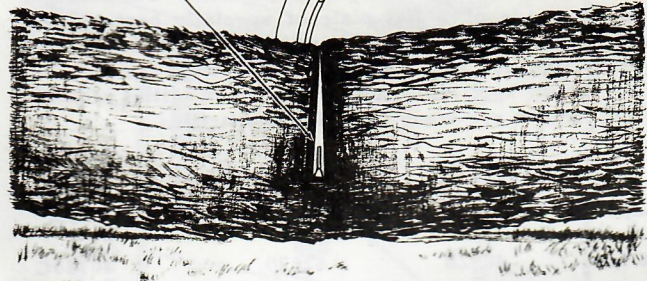


FIG. 15

### Bow saw attachment.

The Mall bow saw completely eliminates chain pinch by returning the chain in an enclosed tube. It permits more maneuverability and is preferred in many parts of the country for all types of cutting operations. (See Fig. 13).

Whether the bow saw is being handled by one or two men, the return tube affords convenience in carrying and during operation. (See Fig. 14). The idler end contains the chain tensioning adjustment. For proper chain adjustment see section under chain maintenance.

Chain pinch is eliminated in this type of chain saw. At no time does the returning chain enter the cut. (See Fig. 15).

The bow saw attachment is offered in two capacities; the 18 inch assembly, No. 41760, and the 24 inch assembly No. 41761. These assemblies include the transmission, guide and chain. With the Model 2MG gasoline engine unit this type of chain saw becomes a powerful and versatile unit.



FIG. 14



FIG. 16



# 40587 PINCHLESS GUIDE ASSEMBLY

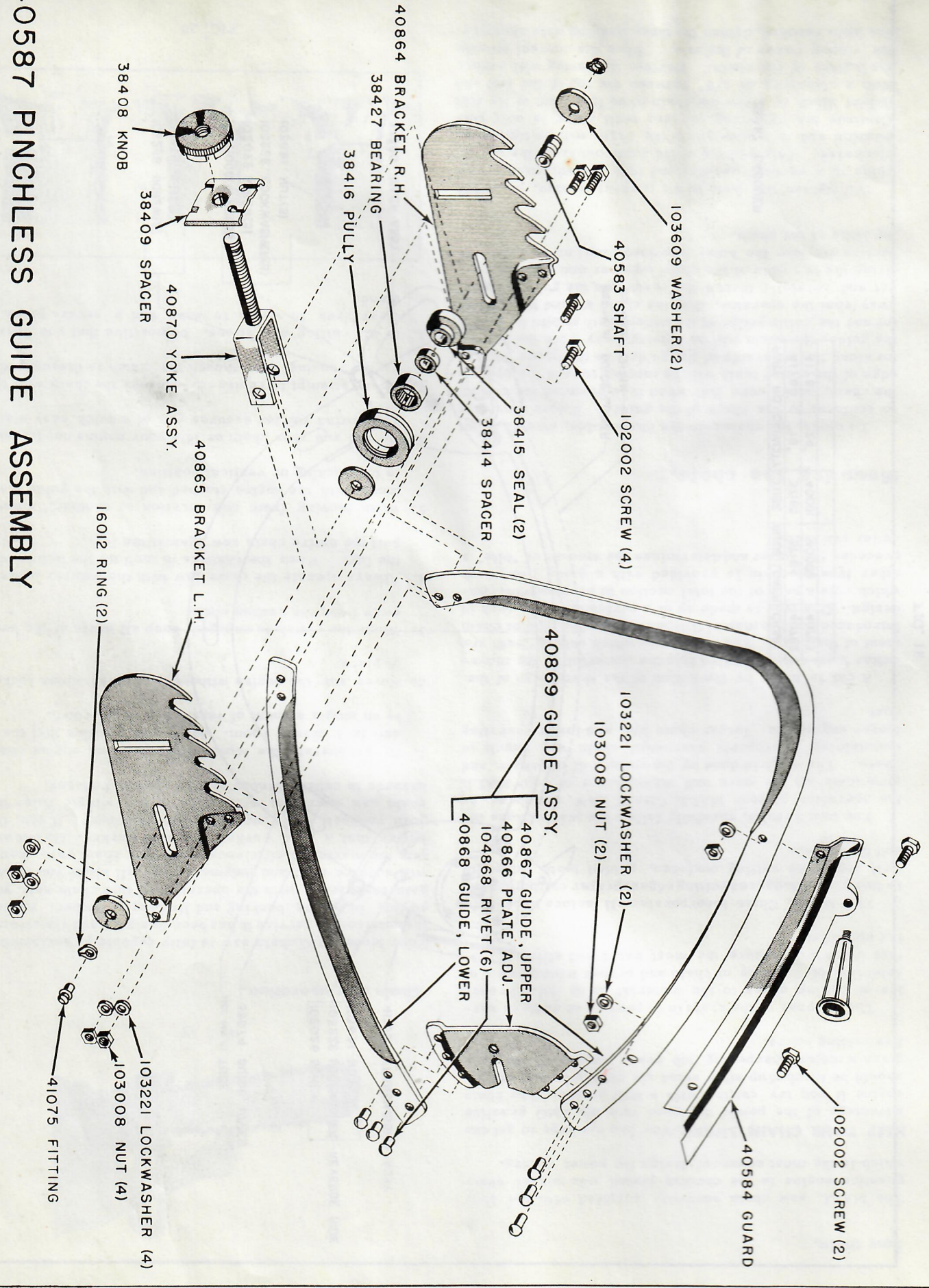
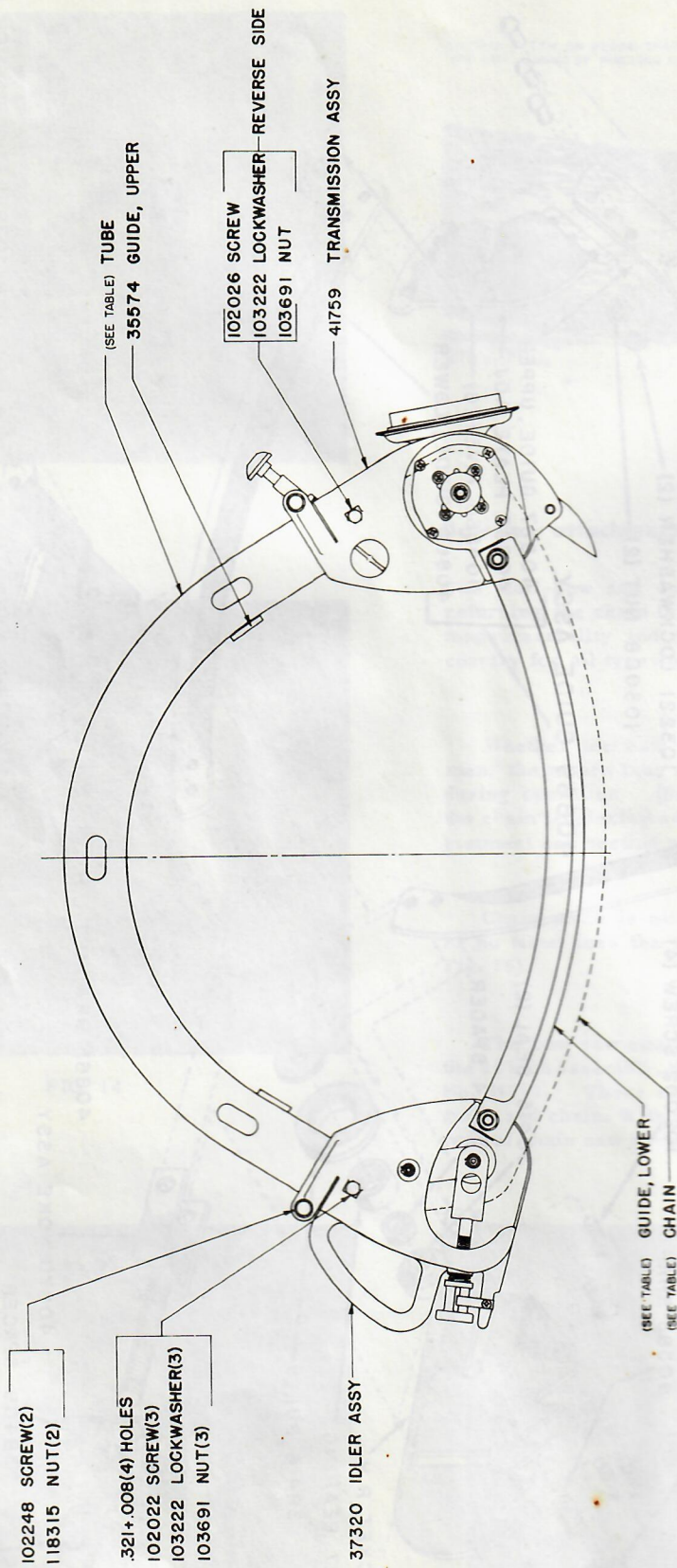


FIG. 17





23467 LACQUER

PART NO.	CAPACITY	TUBE	GUIDE, LOWER	CHAIN
41760	18"	37165	37164	40782
41761	24"	40001	40002	40783

FIG. 18



## Saw chain.

The MALL saw chain normally supplied with the 2MG gasoline engine is the chrome plated side planer chain which is the most advanced design for power cutting.

**KEEP YOUR CHAIN SHARP.** You can not hope to get the advantage of the power designed into the 2MG gasoline engine if you try cutting with a dull chain. The chain should be touched up after about six cutting hours, and be given a major sharpening job every twenty or twenty-five cutting hours.

The purpose of the chain is to provide an endless series of cutting edges to the material to be cut. Proper selection of the type of chain and proper maintenance of that chain will assure the most rapid and efficient cutting operation.

The MALL Chain incorporates all factors necessary to this end--staggered cutting edges, proper cutting angles, well supported cutting surfaces, guided teeth, strength and flexibility.

For best results, carefully follow the instructions for the operation of your MALL CHAIN SAW, and these instructions on the care and maintenance of your MALL Chain. The work is done by the cutters of the chain, and maintaining a properly sharpened chain will result in longer engine life, longer chain life, and lower operating cost.

A cut is made by the action of the sharp edge of the cutter tooth as it is pulled into the material by the movement of the chain. The manner in which cutting teeth are introduced into the material depends upon the type of chain design. One type is made up of a series of teeth, each of which cuts a part of the total section to be removed. Another type of chain is provided with a guide link which precedes the cutter and determines the amount of "bite" a cutter can take.

## Mounting the chain.

To mount the chain onto the chain guide, stretch it out to conform to the shape of the guide. Before mounting the chain, make sure that when it is mounted the cutting edge of the cutter teeth will be moving toward the operator along the underside of the guide. On the upper edge of the guide, the chain will be moving away from the operator and the cutting edge of the cutter teeth should be facing away from the operator. Slip the chain around the sprocket and carefully thread the chain into the guide groove. Bring the two ends of the chain together and slip the connecting pin into the holes provided for it at the connecting links of the chain.

To tighten the chain to the correct tension, place the guide in a vertical position and turn the adjusting screw clockwise. This will move the guide out from the transmission and in consequence the chain will be tightened. Continue the tightening process until there is only sufficient slack to allow the chain to be lifted out of its slot with a clearance of  $1/8$ " between the top of the slot and the bottom of the chain. Further tightening will reduce the cutting power of the saw. When the correct tension has been reached, tighten the three housing nuts securely.

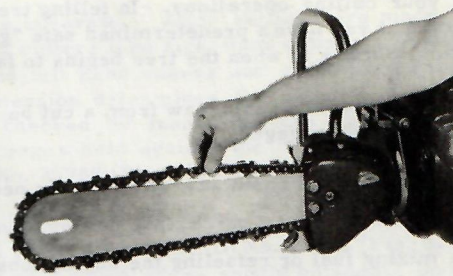


FIG. 19

## Chain saw operation.

Your Model 2MG chain saw is fully capable of performing the outstanding service it has been designed and constructed for, in felling, bucking and limbing of timber. As you gain experience with the operation of this chain saw, you will acquire skill and judgment that will allow you to obtain the maximum efficiency from your chain saw. Remember that a good worker is a safe worker. Do not expose yourself and your chain saw to danger. If you, the chain saw operator, will follow a few simple rules the hazards in cutting timber will be greatly reduced.

1. Never operate the Model 2MG gasoline engine chain saw in a closed room. Always be positive that there is an ample amount of ventilation in the room.
2. Never run the engine without the transmission locked in place.
3. When the clutch is engaged, keep all parts of the body away from the cutting chain.
4. Always operate the chain saw with the bumper against the log. When the chain is in motion, the action will pull the entire chain saw against the log.
5. When moving from one location to another, always move with the engine stopped and with the guide plate in the bucking or vertical position.
6. Do not run your chain or idle your engine needlessly. The rewind starter assures you of a quick, easy start.
7. Do not attempt to replace or sharpen the chain with the engine running, even though the clutch is disengaged.
8. In all cutting operations, be positive that you have a clear area in which to work and a secure place to stand.

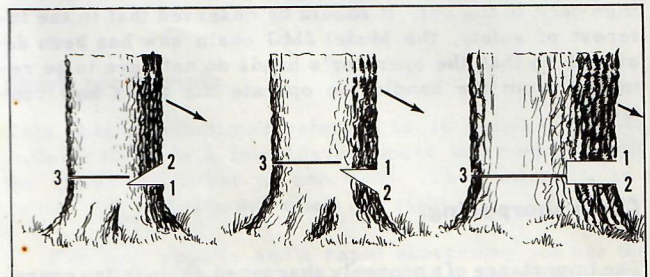


FIG. 20



9. Plan your cutting operations. In felling trees, make certain that you have a predetermined safe "get-away" position to move to when the tree begins to fall.
10. When removing the chain saw from a cut be sure that the clutch is disengaged.
11. Do not operate the chain saw when it is in need of repair.
12. When mixing fuel or refueling the engine, observe the conventional fire precautions.

**FELLING TIMBER.** Before felling a tree, survey the tree and decide how to proceed to the best advantage. At this point, observe the "lean" of the tree and decide where you want the tree for the most efficient bucking and limbing. In preparation for the undercut, clear a sufficient working area around the tree. Index your guide plate to the horizontal or felling position. All felling operations are made with the guide plate in this position.

Under cuts are made on the side toward which the tree must fall. The under cut provides a hinge point on which to tip the tree off the stump in the direction that is desired. Various cuts are used in various parts of the country. Illustrated above are a few types all of which can be made with a Model 2MG chain saw. The cuts are numbered in the proper order of cutting. 1 and 2 are made first and to a depth of approximately 1/4 the diameter of the tree, except for leaning trees which require a deeper under cut.

The back cut is made about 2 inches higher than the bottom of the under cut. The cut should be parallel with the under cut. If all cutting is done properly, the tree will begin falling when only an inch or two of holding wood is left. As a safety measure, the operator should move to a predetermined safe place when the tree begins to fall. If at all possible, this move should be made with the clutch disengaged and the engine stopped. Do not depend on a tree falling similarly to one felled under similar conditions. Each tree has its own characteristics and will fall accordingly. Practice making bucking cuts before attempting to fell trees.

**BUCKING TIMBER.** For bucking operations, index the guide plate and transmission to the vertical position. Make your bucking cut with the bumper against the log. Use the toothed bumper to obtain a "bite" in the log. If it is possible, support the log off the ground to prevent timber bind. Feed the saw into the timber slowly, the rate of feed will depend on the kind and size of the timber. When making a deep cut, the saw slot should be spread with a wedge. It will be found that faster cutting can sometimes be accomplished by rocking the saw forward and then back in the cut. It should be observed that in the interest of safety, the Model 2MG chain saw has been designed so that the operator's hands do not have to be removed from the handles to operate the chain saw controls.

### Chain sharpening.

The importance of a properly sharpened chain in the operation of a chain saw cannot be over emphasized. Speed, efficiency, long life and low maintenance costs can be enjoyed when a chain is properly maintained.

Incorrect sharpening or a dull chain can cause many difficulties reflected in the operation of the chain saw. Out-of-line cuts, jumping, binding and engine stalling are a few of the troubles encountered.

Chains should be "touched-up" after about every six hours cutting time. This can be done while the chain is on the guide and with the proper hand file. Do not attempt to remove much metal and maintain the original cutting angles on all cutting edges. See following information relating to each type of saw chain.

Chains can be sharpened by hand filing or with power equipment. In either case a method of checking dimensions and angles should be available as well as some provision for holding the chain firmly and in a straight line. Use of the Mall Chain Clamp No. T18543, or two straight steel bars 18 inches long, held in a vise will suffice. A straight edge and feeler gage are also required.

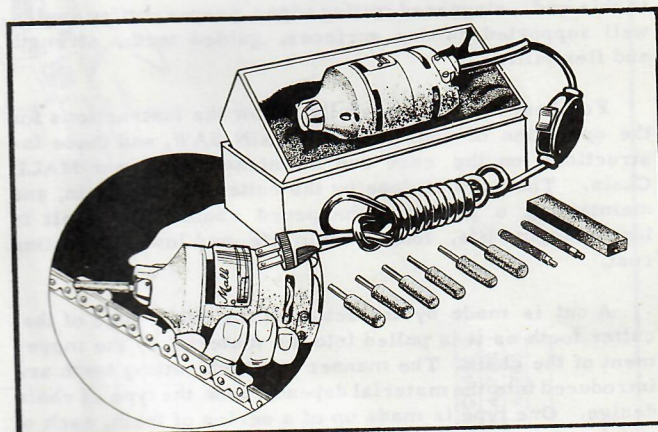


FIG. 21

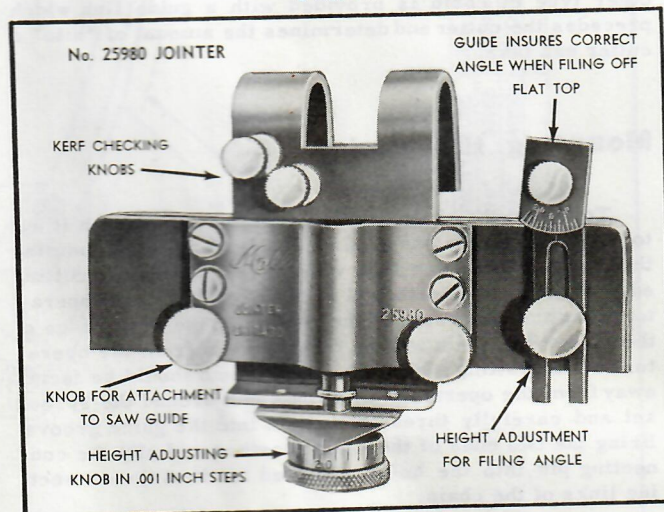


FIG. 22

All cutter teeth should be sharpened at the same time as it is important that all teeth are of equal height. This factor should be checked with a straightedge while filing or grinding procedure goes on. Teeth have been filed to 1/4 of their original height and have performed as well as a new chain.

Following is complete technical data necessary for sharpening various type chains.



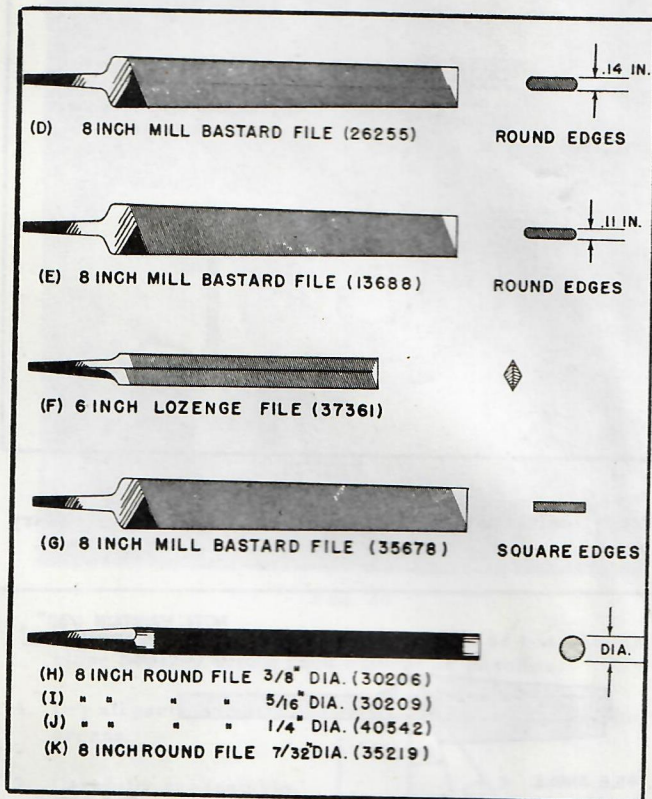


FIG. 23

- (D) Mill Bastard flat file, 8 inch length, round edges No. 26255.
- (E) Flat file, 8 inch length, round edges No. 13688.
- (F) Lozenge file, 6 inch length No. 37361.
- (G) Mill Bastard, 8 inch length, square edges No. 35678.
- (H) Round file, 3/8 inch diameter, 8 inch length No. 30206.
- (I) Round file, 5/16 inch diameter, 8 inch length No. 30209.
- (J) Round file, 1/4 inch diameter, 8 inch length No. 40542.
- (K) Round file, 7/32 inch diameter, 8 inch length No. 35219.

**Standard chain.**

This chain is also referred to as a "Kerf-Chain", a "Scratch-Chain", or a "General Purpose Chain". This chain is made up of outside links which carry left and right cutters and inside links which carry left and right rakers.

The sharpening angles shown in the top view and side view of Fig. 23 can be obtained with the Mall Portable Electric Chain Sharpener, using the thin grinding wheel. Be sure the chain is clamped firmly and that your set-

tings are accurate. After settings are made, grind all left hand cutters then right hand cutters. Change wheels and grind left hand rakers and right hand rakers. The kerf dimension determines the amount of "set" which can be checked by measuring the space between two straight edges held against the outside teeth. The Mall Jointer No. 25980 (Fig. 21) facilitates this adjustment.

A good job of sharpening can also be done by hand filing. A Mill Bastard file (D) No. 26255 (Fig. 22) 8 inches long and with round edges should be used. Do not try to take off too much metal at one time. Long even strokes in one direction, taking care not to rock the file while it is cutting, should give you a well controlled sharpening job. Care must be given in maintaining equal tooth height and also the clearance between the height of the cutter and raker. Normally this should be 1/32 inch, however, the difference in the hardness of woods may require different clearance dimensions. In general, the harder the wood, the greater this clearance.

After filing or grinding always rinse the entire chain in kerosene or oil to wash away metal filings.

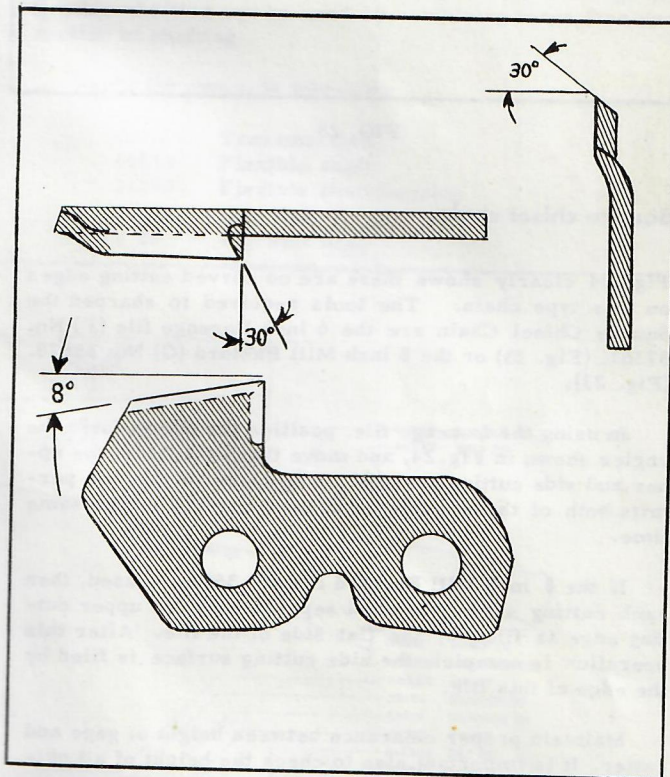


FIG. 24

**Shark tooth chain.**

This chain, sometimes referred to as double-cutter or cutter-raker, is a later development and contains both the cutter and raker on one link. This cutter link is a center link and alternates left and right.

For best results and a rapid sharpening job use the Mall Portable Electric Chain Sharpener and take careful note of the sharpening angles shown in Fig. 24. Remember that the side cutting edges require the thin grinding wheel and the top edges the thick grinding wheel.



To sharpen by hand filing use File (D) No. 26255 for the 9/16-inch pitch chain and File (E) No. 13688 for the 3/8-inch pitch chain. Follow procedure described for the Standard Chain.

The Mall Jointer (Fig. 21) can also be used in "setting" the cutters and rakers on this type chain.

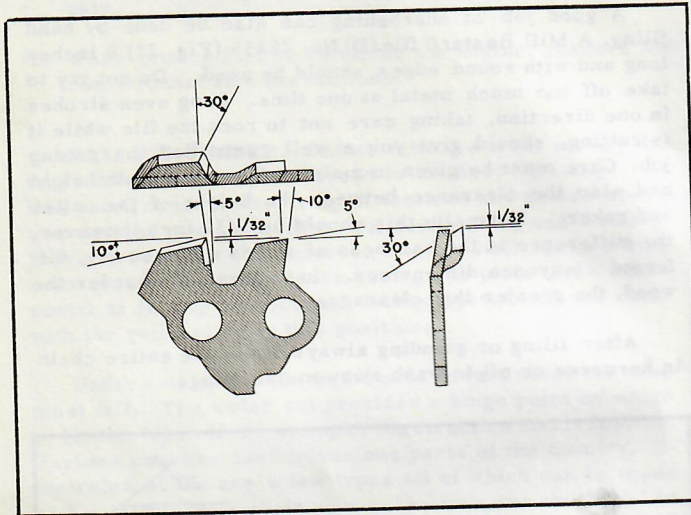


FIG. 25

### Square chisel chain.

Fig. 24 clearly shows there are no curved cutting edges on this type chain. The tools required to sharpen the Square Chisel Chain are the 6 inch Lozenge file (F) No. 37361, (Fig. 23) or the 8 inch Mill Bastard (G) No. 35678. (Fig. 23).

In using the Lozenge file, position the file to form the angles shown in Fig. 24, and move the file against the upper and side cutting surface. The shape of this file permits both of these surfaces to be sharpened at the same time.

If the 8 inch Mill Bastard file (G) 35678 is used, then each cutting surface is filed separately. The upper cutting edge is filed by the flat side of the file. After this operation is complete the side cutting surface is filed by the edge of this file.

Maintain proper clearance between height of gage and cutter. It is important also to check the height of all cutters for they must remain equal after sharpening operations.

### Side planer chain.

This type chain Fig. 26, carries the gage which precedes the cutter on the same link. This makes checking of clearance between height of gage and cutter easier. The Mall Electric Hand Sharpener can be used with the same caution mentioned for use on the Improved Chisel Chain.

For hand filing the 1/4-inch diameter Round file (J) No. 40542 (Fig. 23) can be used. Use only the files recommended as other sizes will not give the desired results. Rinse chain in kerosene or oil after filing to re-

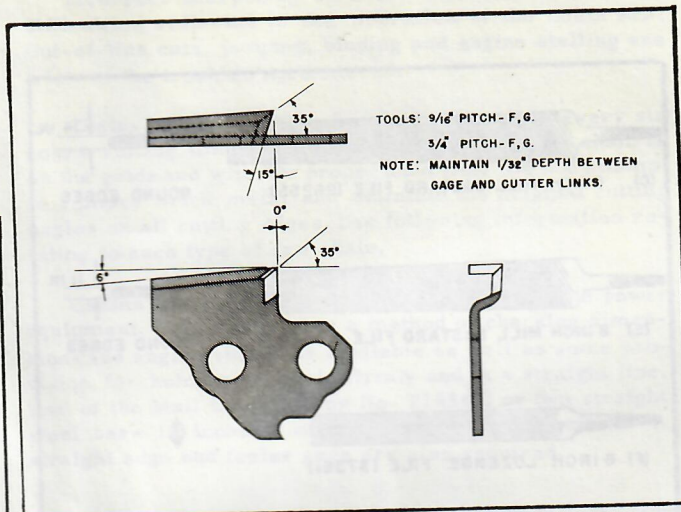


FIG. 26

move metal particles which would cause unnecessary wear.

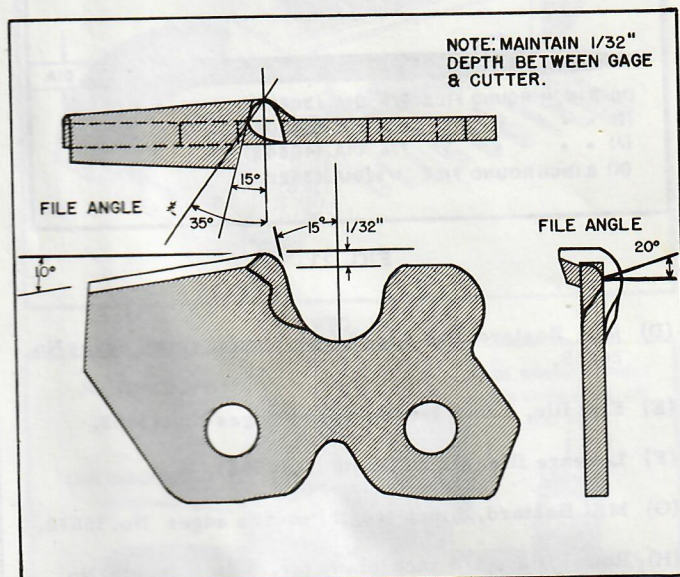


FIG. 27

## SECTION 2. EARTH AUGER ASSEMBLY

The 2MG gasoline engine can be quickly equipped as an earth auger by attaching the 41400 transmission and an auger of desired diameter size. The earth auger is adaptable to boring holes in the ground for posts or poles, for seedling planting, for grease traps or drainage beds. It is equipped with handles for two-man operation. (Fig. 28).

### Transmission maintenance.

The gear housing will require fresh grease every 1000 operating hours. To replace grease:

1. Remove the seven cover screws.
2. Carefully lift the cover with the gears from the housing.





FIG. 28

3. Scoop out as much of the old grease as possible and rinse housing with a good solvent or gasoline.
4. Dry all parts and fill housing two-thirds full with 30599 grease.
5. Carefully reassemble.

### Augers.

Auger bits are made 30 inches in length and are interchangeable. Available sizes:

40375	6 inch diameter
40374	9 inch diameter
40795	12 inch diameter

### SECTION 3. CONCRETE VIBRATOR ASSEMBLY

Concrete vibrating is used to compact concrete after it has been poured. It is recognized as the most effective method of placing concrete. In almost all cases vibrated concrete has greater strength, durability and uniformity. This is largely due to the fact that drier mixes can be used which prevent material segregation.

The concrete vibrator assembly consists of the engine, transmission, various sections of flexible shaft and housing and the vibrator head. Up to 21 feet length of flexible shafting can be used by combining more than one section of shafting.

#### Parts for concrete vibrating:

41720	Transmission
35814	Flexible shaft
21070	Flexible shaft housing
35820	Coupling
V 23	Vibrator head

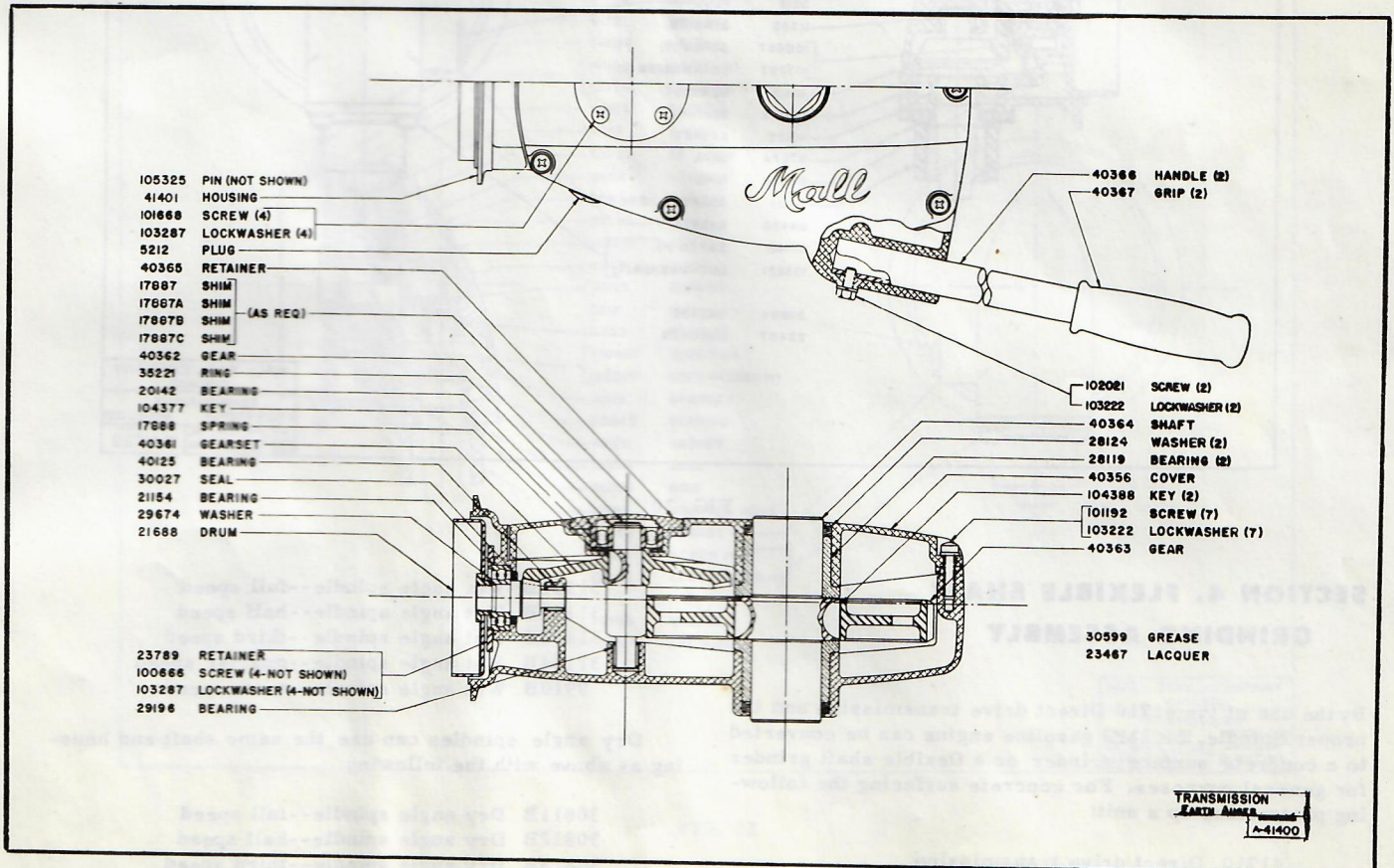


FIG. 29



The transmission provides a step-up in speed from 2 to 1. The internal threads at the connection receive the flexible shaft housing. The grease should be changed after 1000 operating hours. To do this, separate the housing of the transmission and scoop out as much of the old grease as possible. Rinse the internal parts with a good solvent or clean gasoline. Fill the housing two-thirds full with 30599 grease and reassemble carefully. (See Fig. 29).

The flexible shaft and housing should be disassembled after 25 operating hours, cleaned and regreased. Wash the shaft thoroughly in a good grease solvent or kerosene and dry completely. Make a swab from some clean rags and pull the swab, soaked in kerosene, through the flexible shaft housing. Repeat until the housing is clean. When reassembling the shaft into the shaft housing, smear a

thin coat of grease onto the shaft with the hand as the shaft is pushed into the housing.

Do not over-lubricate. Heat, due to friction, causes the grease to be forced into the opposite ends of the attachments.

The vibrator head should be thoroughly cleaned and relubricated about every 50 operating hours. The rotor, with bearings attached, should be removed from the vibrator shell and washed in solvent or gasoline. The inside of the vibrator shell should also be rinsed out. Relubricate with 2 oz. of turbine oil, Mall 37060. All vibrator housing threads and coupling threads should be lubricated with an adequate supply of white lead before assembling. This application will give the threads a water tight fit.

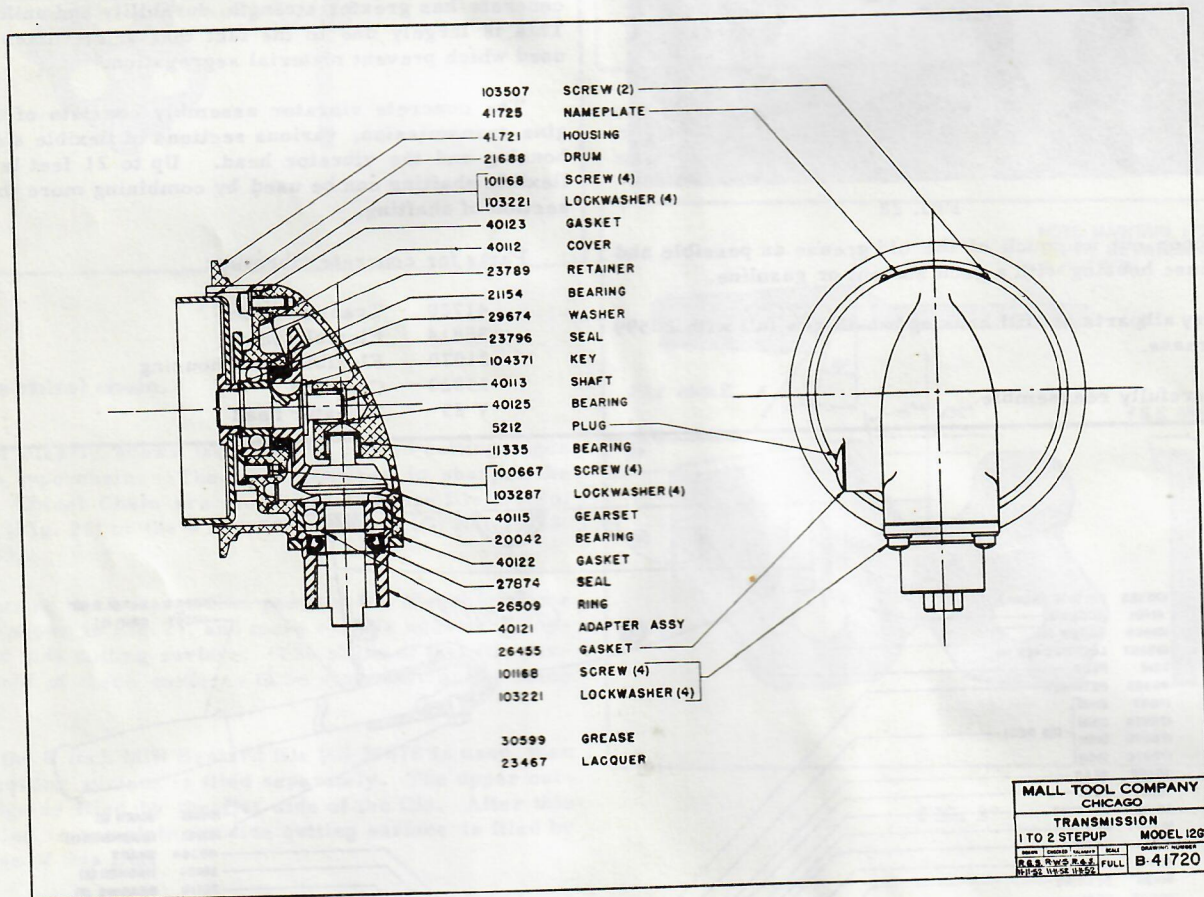


FIG. 30

### SECTION 4. FLEXIBLE SHAFT GRINDING ASSEMBLY

By the use of the 41710 Direct drive transmission and the proper Spindle, the 2MG gasoline engine can be converted to a concrete surface grinder or a flexible shaft grinder for general purposes. For concrete surfacing the following parts make up a unit:

- 41710 Direct drive transmission
- 32954B Flexible shaft
- 36682B Flexible shaft housing

- 31151B Wet angle spindle--full speed
- 31152B Wet angle spindle--half speed
- 31153B Wet angle spindle--third speed
- 31154B Wet angle spindle--quarter speed
- 9910B Wet angle spindle--tenth speed

Dry angle spindles can use the same shaft and housing as above with the following:

- 30811B Dry angle spindle--full speed
- 30812B Dry angle spindle--half speed
- 30813B Dry angle spindle--third speed
- 30814B Dry angle spindle--quarter speed



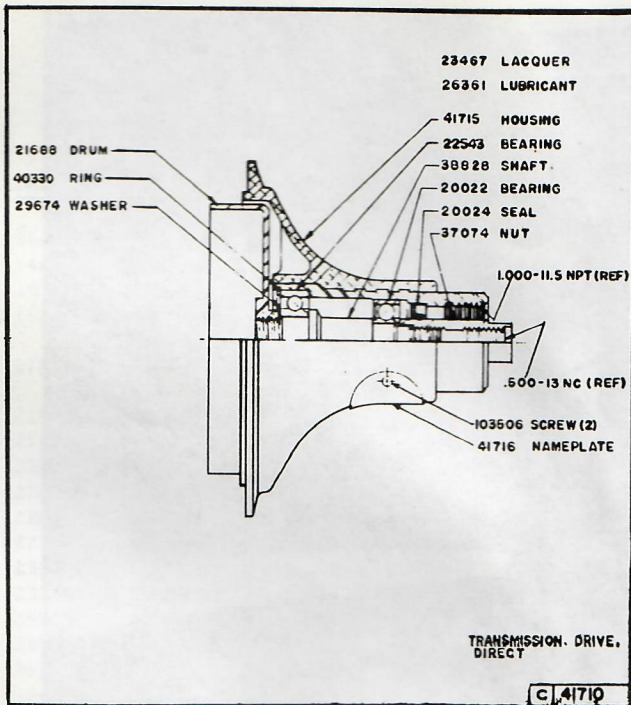


FIG. 31

The maintenance on the transmission and the flexible shaft and shaft housing should be the same as described in the preceding sections. For Spindle maintenance however, these suggestions should be followed:

The grease in the gear housing should be replaced every 6 months with fresh grease No. 19346. Referring to Fig. 32, follow these steps:

1. Remove the 6792 Screw.
2. Remove the 100877 Screws (3).
3. Carefully lift the 15196 Plate out of the housing. To this will be connected the shaft, gear and rear bearing.
4. Wipe out old grease.

**WARNING:** Do not wash these parts in gasoline or grease solvent, as the bearings are lifetime lubricated and this would remove the lubricant.

5. Replace two-thirds full of Mall 19346 grease and carefully re-assemble.

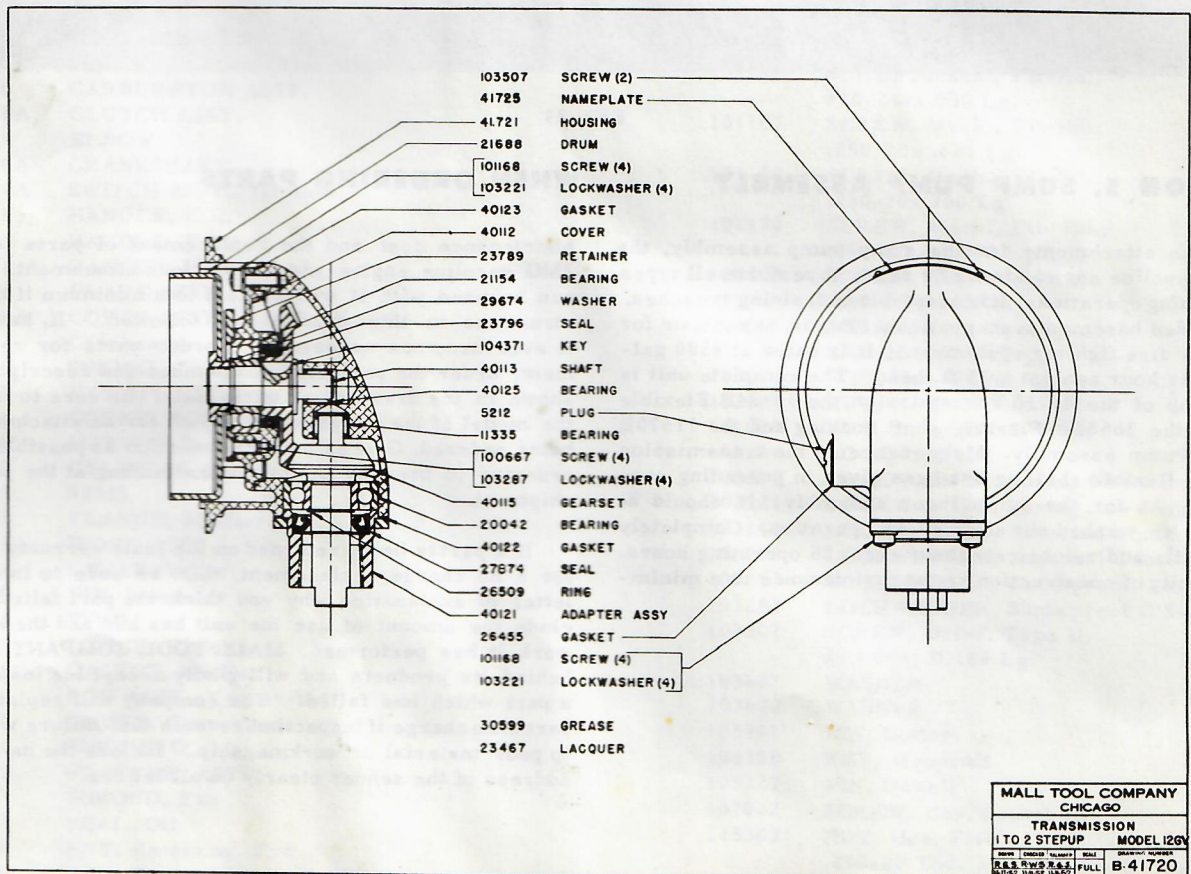


FIG. 32





FIG. 33

## SECTION 5. SUMP PUMP ASSEMBLY

With the attachments for the sump pump assembly, the 2MG gasoline engine stands by ready to perform all types of pumping operations. It is adaptable to draining trenches, or flooded basements, excavations, tunnels, sewers, or for standby fire fighting equipment. It is rated at 4500 gallons per hour against a 25 ft. head. The complete unit is made up of the 41710 Transmission, the 32984B Flexible shaft, the 36682B Flexible shaft housing and the 11570B Sump Pump assembly. Maintenance on the transmission and the flexible shafting has been given in preceding sections. As for the Sump Pump assembly, it should be thoroughly washed out after every operation. Completely dismantle and relubricate about every 25 operating hours. Simplicity of construction keeps maintenance to a minimum.

## WHEN ORDERING PARTS

Maintenance cost and the replacement of parts for the 2MG gasoline engine and the various attachments which can be used with it will be kept to a minimum if the instructions in this manual are followed. If, however, it ever becomes necessary to order parts for replacement, order the parts by Mall number and description as shown in the drawings or parts lists. Be sure to include the model of the power unit if a part for an attachment is being ordered. Give as much information as possible when ordering to prevent any misunderstanding at the point of shipment.

If a part is being returned on the Mall warranty policy for a no charge replacement, then be sure to include a letter of explanation why you think the part failed. Include the amount of use the unit has had and the kind of work it has performed. MALL TOOL COMPANY stands behind its products and will gladly accept for inspection a part which has failed. The company will replace that part at no charge if inspection reveals that failure was due to poor material or workmanship. Include the name and address of the sender clearly on all letters.



# PARTS LIST FOR MODEL 2MG GASOLINE ENGINE

Part Number	DESCRIPTION	Part Number	DESCRIPTION
3647-H	RING, Lock, Internal	41596	WASHER
14652	BEARING, Roller	41609	WASHER, Spacer
18721	WIRE, Locking	41689	BUTTON, Plug
18879	SCREW, Mach-Hd, Phil. Slot #10-24x.500 Lg.	41911	WASHER
21475	SCREW, Mach, Fil-Hd, #8-32x 1.375 Lg.	42311	SCREEN, Fan
21916	RING, "O"	42322	LINK ASSY., Throttle
21949A	MUFFLER	42339	SPRING, Link, Throttle
22070	CAP ASSY., Gasoline	42373	RING, Fan
22551	BEARING, Ball	42435	PLUG
22622	GASKET, Cleaner, Air	42450	RING, Piston
22794	LOCKWASHER	42457	PISTON ASSY.
23379	GASKET, Carburetor	42484	FAN
23386	GASKET, Manifold	42488	SCREW ASSY., Clamp
25513	LOCKWASHER, Spring	42491	CLEANER ASSY.
25671	SPARKPLUG	42729	WASHER, Wave
36263	RING, Retaining, Internal Bevel	42730	BEARING, Needle
36424	RING, Retaining, External	42744	CLAMP
36436	WASHER, Cup	42745	CLIP, Holddown, Wire, Magneto
36445	SCREW, Machine, Hex-Hd.	42772	CARBURETOR
36536	SEAL, Oil	42784	RING, Locating
37061	COCK, Shutoff, Fuel	42785	LOCKWASHER, Int. Tooth
37062	LINE ASSY., Fuel	100668	SCREW, Machine, Flat-Hd., .250-20x.750 Lg.
37143	SCREW, Machine, Flat-Hd.	101130	SCREW, Mach., Fil-Hd., #10-24x1.000 Lg.
37510	CARBURETOR ASSY.	101167	SCREW, Mach., Fil-Hd., .250-20x .625 Lg.
37533A	CLUTCH ASSY.	101168	SCREW, Mach., Fil-Hd., .250-20x.750 Lg.
40004	ELBOW	101170	SCREW, Mach., Fil-Hd., .250-20 x 1.000 Lg.
40286A	CRANKSHAFT	102005	SCREW, Cap, Hex-Hd., .250-20 x 1.250 Lg.
40711A	SWITCH ASSY., Ignition	102007	SCREW, Cap, Hex-Hd., .250-20 x 1.750 Lg.
40888	HANDLE, L.H.	103006	NUT, Hex #10-24 Thd
40889	HANDLE, R.H.	103008	NUT, Hex, .250-20
40893	GASKET, Plate, Reed	103028	NUT, Hex, .250-28 Thd.
40894	PLATE ASSY., Reed	103204	LOCKWASHER
40895A	COVER ASSY., Gas Tank and Crankcase	103213	LOCKWASHER, Spring #8 Screw
40896	SPRING, Compression	103221	LOCKWASHER, Spring .250 Screw
40897	NAMEPLATE	103247	LOCKWASHER, External Tooth
40898	CONNECTOR, Manifold	103250	LOCKWASHER, External Tooth
40899	MANIFOLD, Intake	103253	LOCKWASHER, Shakeproof, Ext.
40929	CYLINDER ASSY.	103287	LOCKWASHER, Shakeproof C'Sunk
41056	SEMS	103507	SCREW, Drive, Type U #2 (.098) D.187 Lg.
41091	FLANGE, Muffler	103607	WASHER
41155	INDEX ASSY.	103672	WASHER
41198	LEVER, Index	103701	PIN, Cotter
41199	PIN, Index	104368	KEY, Woodruff
41202	STUD	105227	PIN, Dowell
41203	LEVER, Throttle	107022	SCREW, Cap, Socket-Hd.
41205	GASKET, Muffler	118303	NUT, Hex, Flexloc .250-20 Thd.
41314	ROD ASSY., Connecting	118344	NUT, Hex., Flexloc .312-24 Thd.
41315	COVER, Crankcase	118349	NUT, Hex, Flexloc, .625-18 Thd.
41324	MAGNETO		
41329	STARTER ASSY.		
41333	SHROUD, Fan		
41351	SEAL, Oil		
41354	NUT, Retaining, Fan		
41356	KEY, Fan and Magneto		
41535	DECAL		
41536	DECAL		
41565	RETAINER, Pawl		
41594	WASHER, Wave		



# PARTS LIST FOR MODEL 2MG GASOLINE ENGINE (Cont.)

## SUBASSEMBLIES

Part Number	DESCRIPTION
----------------	-------------

**STARTER ASSEMBLY, Rewind (41329)**

36792	RING, Retaining, External
41349	SPRING, Rewind
41353	BUSHING, Starter, Housing
41555	PAWL, Starter
41557	CAM, Pawl
41561	PULLEY, Starter
41569	WASHER, Spacer
41570	WASHER, Brass
41579	WASHER, Wave
41592	HANDLE, Starter
41616	ROPE, Starter
41630	ROLLPIN
41811	INSERT, Handle
41812	PLATE, Insert
42455	SHAFT ASSY.
42460	COVER ASSY.
42461	HOUSING, Starter
42729	WASHER, Waved
100625	SCREW, Mach. Flat-Hd. Phil-Slot #10-24
100667	SCREW, Flat-Hd, Phil-Slot
101170	SCREW, Mach. Fil-Hd., Phil-Slot
103221	LOCKWASHER, Spring
103285	LOCKWASHER, Ext. Tooth

**CARBURETOR ASSEMBLY (37510)**

20939	PLUNGER
20941	SCREW
20942	SPRING
20943	SHAFT ASSY.
20947	PIN
20953	GASKET
20959	SCREW
23411	NUT
23412	SCREW ASSY.
23413	IDLETUBE ASSY.
23414	SCREW, Adj., Idle
23417	GLAND
23418	GASKET
23419	SCREW
23425	FLOAT ASSY.

Part Number	DESCRIPTION
----------------	-------------

23426	SCREW, Plug
23427	NEEDLE AND SEAT ASSY.
35181	PLUG
35184	SPRING
35185	PLUG
35186	SHUTTER, Choke
35187	RING
35188	SPRING
35189	PIN
35191	SHAFT
35193	NOZZLE
38117	BODY
38118	GASKET
38119	BOWL
38120	STEM, Valve, Drain
38121	SHUTTER, Throttle
38122	PACKING
100081	SCREW
101109	SCREW
103213	LOCKWASHER
104982	PLUG
105031	PIN
105033	PIN

**MAGNETO (41324)**

32481	CLAMP
41316	CONDENSER ASSY.
41317	LEAD ASSY.
41318	COIL ASSY.
41319	PLATE ASSY.
41320	CONTACT ASSY.
41321	COVER
41322	CAM
41323	MAGNET ASSY.
101102	SCREW
103003	NUT
103217	LOCKWASHER
103604	WASHER

**CLUTCH ASSY. (37533A)**

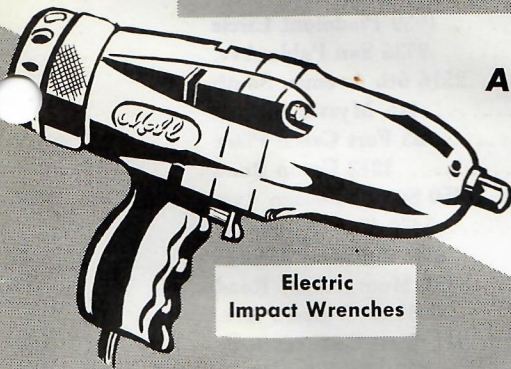
38171	SHOE, Clutch
38174A	HUB and PLATE ASSY.
41915	SPRING, Clutch



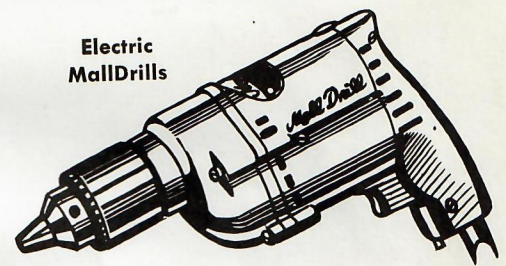
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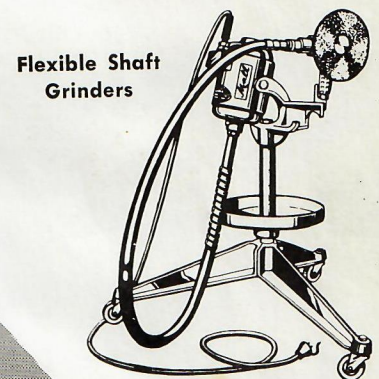
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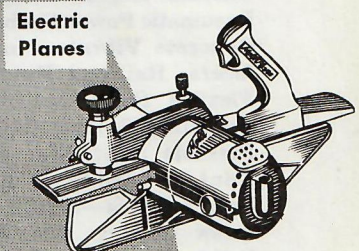
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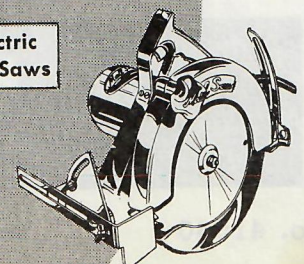
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