Instruction Book *and* List of Parts

MODELS

A—B—C—CA—CX

Help Us—So We Can Serve You Promptly

When ordering repairs always give us the following information so we can be sure of sending you the correct parts:

Part number.
Horse-power of engine.
Engine number.

You will find the number and horse-power of engine on the brass plate on the top of the water reservoir.

Do not send us the parts as sample. Pick out the part in the pictures on pages 7, 8 and 9, then refer to the number given on the following pages and order by the name and number of the part.

If you do not give us the information as requested above, we may have to write you for it before we can send the parts you want.

SEARS, ROEBUCK AND CO.

The World's Largest Store

F12187.Rev.8.1.29-P.P. & F.

What to Do If Your Engine Fails to Run.

Be Sure the Tank Is Full of Gasoline.

BATTERY AND WIRING.

If the engine refuses to run see that the switch works properly, that the spark coil is connected and that the wires connecting the battery to the engine are not broken. Be careful that the wires do not get wet or soaked with oil, as this will cause a short circuit and you will not be able to get a spark at the igniter. Test the batteries, they should show not less than 20 amperes.

THE IGNITER.

Examine the **igniter,** see that it works freely, that it trips all right and that the spark comes at the right time (see page 5). Take the ends of the wires attached to the igniter, touch them together and see if you get a good spark. If you don't, the trouble is with your battery or the wiring. If the spark is all right, the trouble may be in the mixing valve.

MIXING VALVE.

See that the valve through which the air passes works freely. Open the needle valve and push up on the stem at bottom of mixer; if the gasoline drips, the feed is all right; if it does not drip, the **tank may be empty** or the pipe clogged. Test the gasoline for water; pour a little in the palm of your hand and hold for a few minutes; the gasoline will evaporate and leave the water. If you find water, drain tank and refill. **To prevent dirt and water getting in the gasoline,** strain the gasoline through chamois skin. Dirt or water will cause irregular running and will finally shut down the engine.

LOSS OF COMPRESSION.

If the engine runs without very much energy, will not pull a load or furnishes very little power, the trouble may be caused by loss of compression. To test for **loss of compression,** turn the flywheels over when the exhaust valve is closed. If you get considerable resistance and the cylinder holds the gas, the compression is all right. If the resistance is weak, there is a leak some place.

First—If you use a poor grade or too much gasoline or lubricating oil it forms a carbon deposit around the rings, causing them to stick so they will not hold the compression so that it gets by the piston. To remove this carbon, clean the piston and rings thoroughly with kerosene and be careful of the gasoline and lubricating supply in the future. It may be that the rings are worn out, or one of them may be broken. (See 47B121 on page 11.)

Second—The cylinder head or igniter packing may be worn out. Test for loss of compression and listen for a hissing sound at cylinder head or igniter. To repack cylinder head or igniter, use packing No. 47B81 as furnished, see page 10; soak the packing in linseed oil or

shellac, be careful you do not tear the packing. After you put the packing in place, screw the nuts down as far as you can by hand and then use a wrench. Turn the nuts a half turn each until they are perfectly tight.

Third—If in starting the engine you hear a hissing sound at the cylinder head, there may be a little particle of dirt under the exhaust or inlet valve. Have someone turn the flywheels around to throw the piston against compression. Just as he does this, bump the end of the valve stem with a block of wood to open the valve, and the air pressure in the cylinder may blow out the dirt. If this does not stop the leak, the valve will have to be ground. (See page 4.)

Squirt a little kerosene on the exhaust valve stem occasionally, this helps to remove any carbon which may have accumulated and prevents valve stem from sticking. It is a good plan to put a few drops of oil on both valve stems every time you run the engine.

THE IGNITER POINTS.

If you have gone over all the above and still fail to get a spark and you get a spark at the igniter on the outside of the cylinder, it may be the trouble is with the **igniter points.** Remove the igniter, fasten the wires to the regular terminals and snap the igniter by hand. If you fail to get a spark, the igniter is short circuited, or the points are sooted. Clean points with fine file or emery cloth so they make a good contact. If you find a short circuit, take the igniter apart and clean it thoroughly.

RUNS IRREGULARLY.

If the engine, after having run satisfactorily, commences to misfire, runs irregularly, draws in gasoline several times before it explodes, coughing and choking, there is **not enough gasoline** in the tank to allow the engine to get the proper mixture. It is never advisable to allow the gasoline supply to run too low, as the engine will always give better results with the tank full than when it is nearly empty. If the engine kicks back when starting, the spark is advanced too far, so that it explodes the charge at the wrong time. (See page 5.)

GOVERNOR.

The governor consists of two balls controlled by a spring inside the governor spindle and is operated by three gears. If the engine runs above the regular speed, the balls on the governor are thrown out, which presses in on a pin going through the governor spindle which works the detent so it catches behind the block on the cam rod and holds the exhaust valve open, at the same time stopping the spark, which prevents any suction of gasoline or explosion in the cylinder.

As soon as the speed is reduced to normal, the cam rod is released. In this way the speed of the engine is controlled and you get the best results with the least consumption of fuel and batteries.

The normal speed of the 2 horse-power engine is 450 revolutions a minute, 400 revolutions on the 4 horse-power, 375 revolutions on the 6-horse power, 350 revolutions on the 8 horse-power and 300 revolutions on the 10 horse-power.

HOW TO ADJUST THE DETENT BLADE.

When the exhaust valve is wide open and the detent blade is pushed in behind the catch block on the cam rod, there should be only the thickness of a postal card between the end of the detent blade and the catch block. As the detent blade passes the catch block on the cam rod, the blade should stand about ¾ inch away from the block. If the detent blade is out more than ¾ inch take a pair of pliers and bend it into the proper position.

To adjust the play between the end of the detent blade and the catch block loosen the locknut that holds the blade and screw the adjusting screw either in or out, until you have the blade where it should be, then tighten the locknut.

TO REMOVE GOVERNOR SPINDLE, BALLS OR THE PINION.

If it is necessary to take the governor apart, to remove the governor pinion, hold the flywheels stationary to lock the gears. Then take a monkey wrench and turn the governor spindle to the right while standing on the governor side of the engine. The governor pinion is screwed to the governor spindle.

GRINDING THE VALVES.

Figure 8 shows the method of grinding a valve that does not seat properly. Place the head of cylinder so that it is solid, put a screwdriver in the slot in the valve, put the valve in the valve seat and between the two surfaces put some valve grinding compound and a little oil. If you cannot get valve grinding compound use pumice stone. Turn the valve to the right about six times and then to the left about six times and continue this operation until the valve and valve seat show an even surface all the way around, as shown by the arrows. **In replacing the valves be sure that you get the right springs on the right valves and that you don't get any dirt in them. The heavy spring is for the exhaust valve, and the light one for the intake valve.**

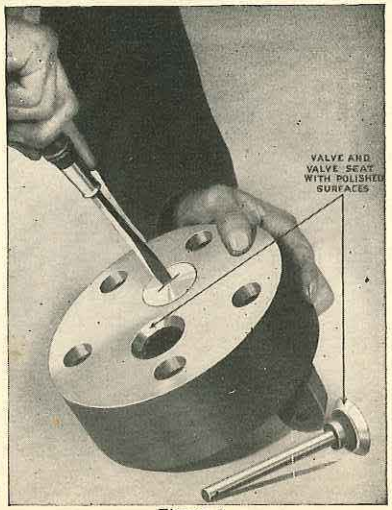


Figure 8.

When the Spark Should Take Place

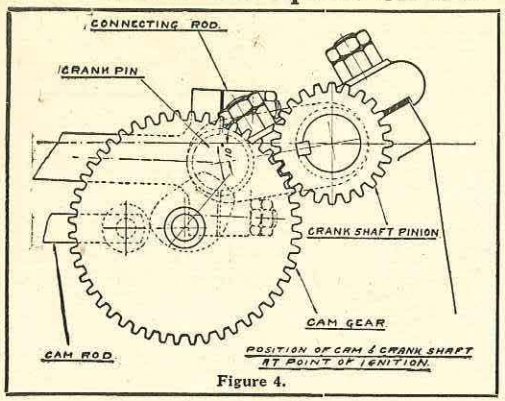


Figure 4.

The time of the snap at the igniter is the time the spark takes place. If you turn the flywheels over slowly by hand and stop instantly when you hear the igniter snap, you can tell just where the spark takes place.

Figure 4 shows the position the cam gear, crankshaft and connecting rod should be in when the spark occurs. If it occurs at any point different from this you will not be getting the best results.

TO ADJUST SPARK ON THE 2 HORSE-POWER ENGINE.

If the spark occurs too soon, that is, before the crankshaft and connecting rod get in the position as described above, loosen locknut "D," Figure 5, about one-half turn and tighten locknut "C." This pulls the trip lever back and causes the spark to occur just a little later. Try the spark and if it is still too soon, repeat the above.

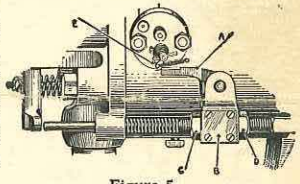


Figure 5

If the spark occurs too late or after the crankshaft passes the point as described above, loosen locknut "C" and tighten locknut "D." This advances the spark by pushing the lever forward on the rod.

TO ADJUST SPARK ON 6, 8 and 10 HORSE-POWER ENGINES.

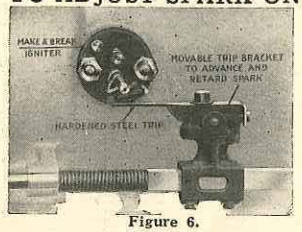


Figure 6.

Turn the flywheels around to the right. If the igniter snaps after the cam gear and crankshaft have passed the position as shown in Figure 4, the igniter trips too late and the hardnened steel trip should be pushed forward. If the igniter snaps before the cam gear and crankshaft reach the position as shown in Figure 4, it is tripping too soon and the hardened steel trip should be pulled back.

To advance the spark loosen the locknut on top of the trip bracket, Figure 6, and turn the adjusting screw to the right; to retard the spark turn the screw to the left. After the trip is in the proper position tighten the locknut; then turn the flywheels over again and see if the igniter snaps at the right place, as in tightening down the locknut it sometimes changes the time the spark takes place.

How to Set Cam Gear for Opening the Exhaust

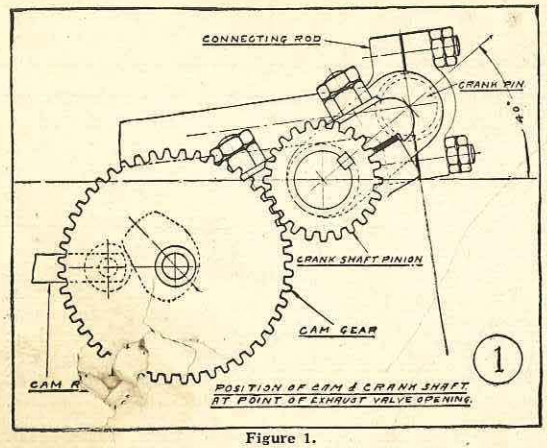


Figure 1.

The cam on the cam gear, as shown in Figure 1, opens and closes the exhaust valve and controls the spark, so that it is very important that it should be set just right. The cam gear was in proper position when the engine left the factory and should not be removed unless it is absolutely necessary, in which case you should be very careful to see that it is put back properly.

To set the cam gear, turn the flywheels around to the right until the crankshaft and connecting rod are in the position as shown in Figure 1. Then slip the cam gear on the cam gear shaft, being sure that cam is in the same position as shown.

The exhaust valve should close when the crankshaft, connecting rod and cam are in the position as shown in Figure 2. If, when putting the cam gear on the first time, it doesn't open and close the exhaust valve, as shown in these two drawings, take off the gear and turn it to the right or left one tooth, and then try it again. If there should be a little variation, this can be taken up by adjusting the screw at the end of the cam rod on the exhaust valve lever.

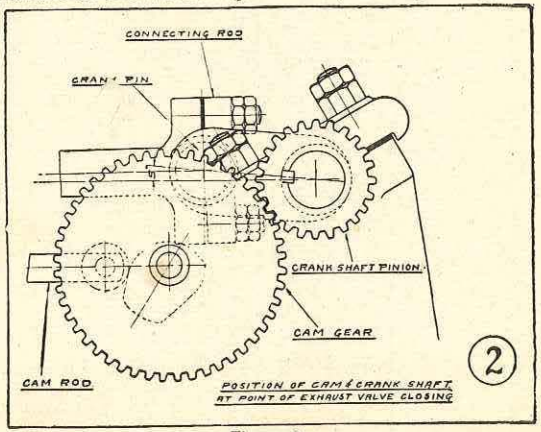
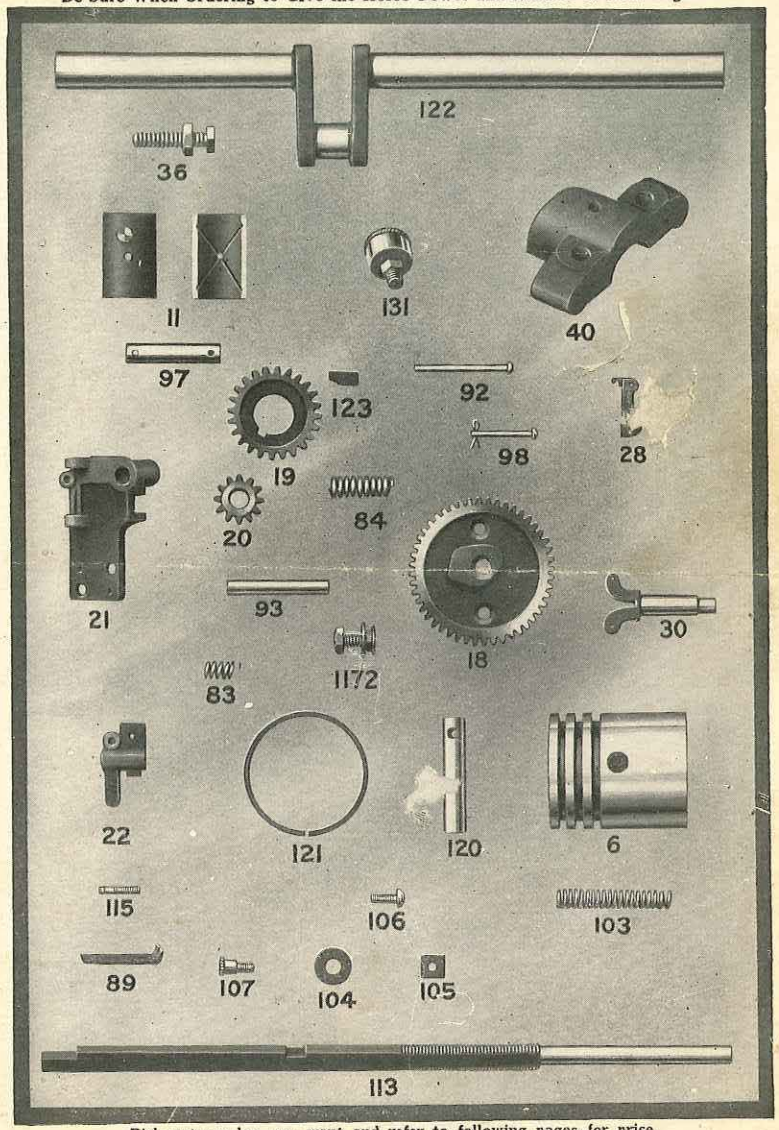
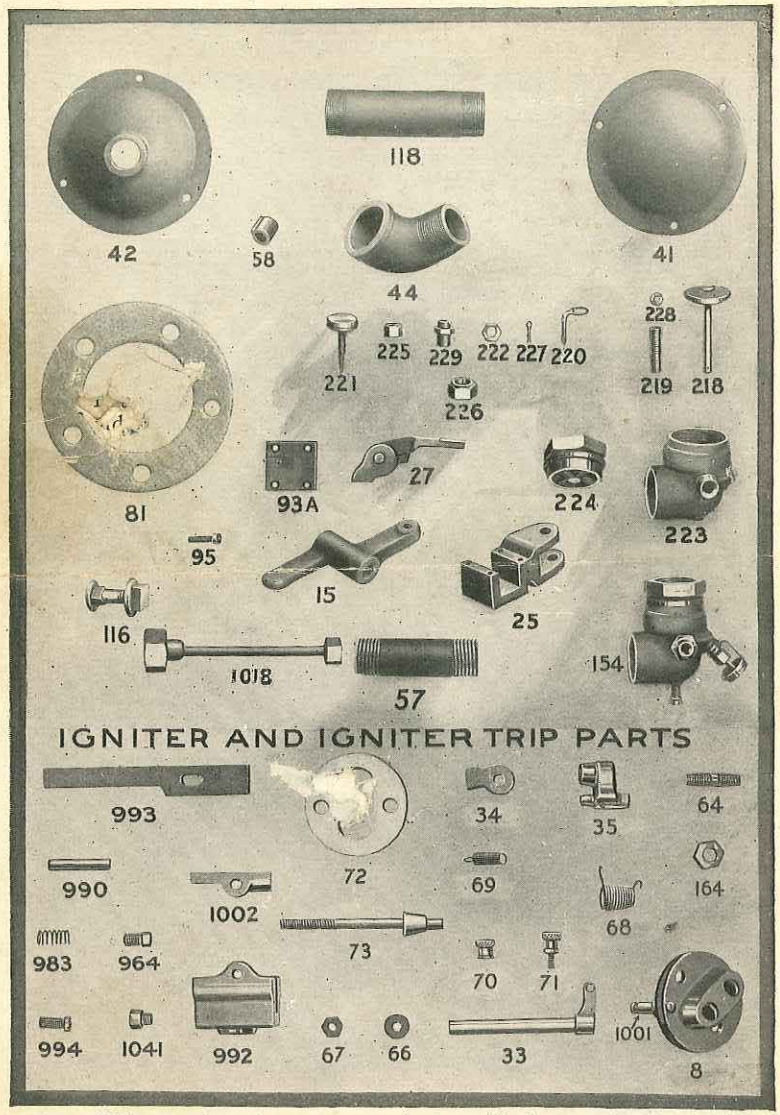


Figure 2.

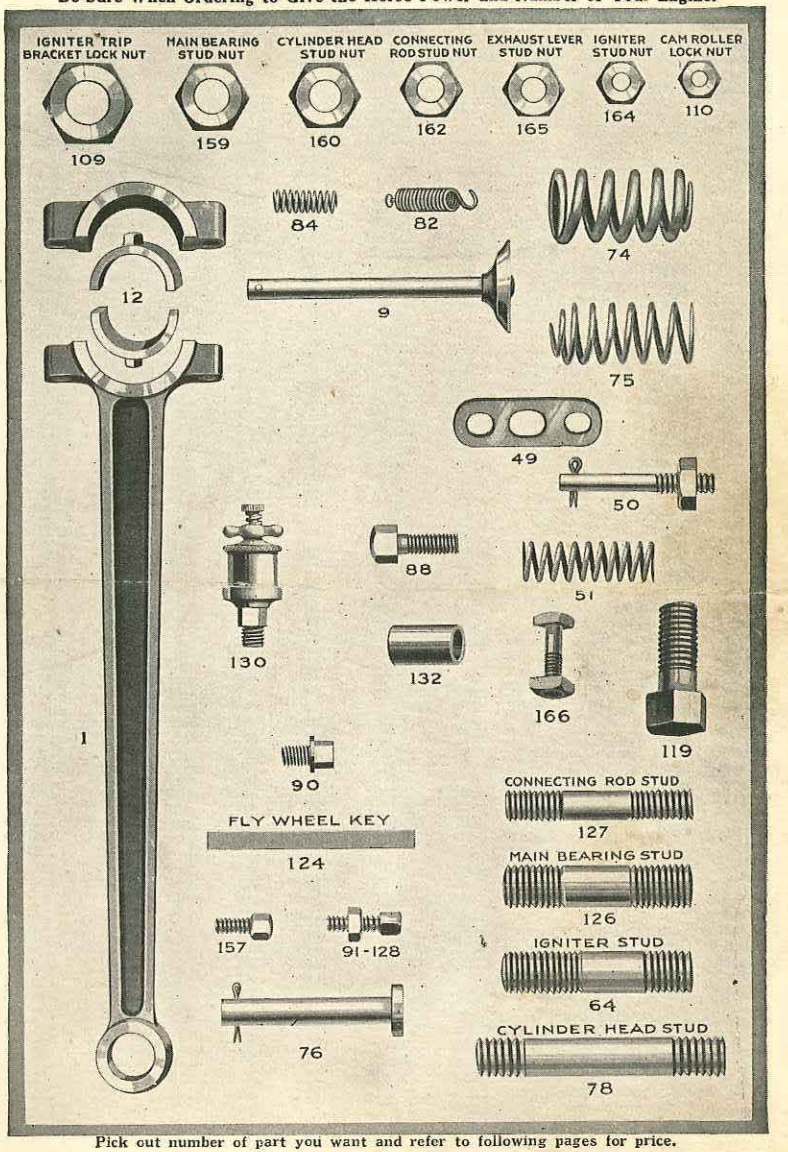
Be Sure When Ordering to Give the Horse-Power and Number of Your Engine.



Pick out number you want and refer to following pages for price.



Pick out number of part you want and refer to following pages for price.



Pick out number of part you want and refer to following pages for price.

Be Sure When Ordering to Give the Horse-Power and Number of Your Engine.

Part No.	Name of Part	1½ H.-P.	2 H.-P.	4 H.-P.	6 H.-P.	8 H.-P.	10 H.-P.
47B1	Connecting Rod with Cap and Bolts. We cannot furnish the cap separately	$4.50	$7.70	$ 9.75	$11.75	$17.25	$20.85
47B1A	Connecting Rod Complete with Bearings and Liners	5.40	8.75	11.35	13.95	19.85	24.90
47B6	Piston	2.90	4.50	5.60	7.75	10.45	13.50
47B8	Igniter Body	1.65	1.65	1.65	1.65	1.65	1.65
47B9	Exhaust or Inlet Valve	.40	.65	.85	1.00	1.25	1.55
47B11	Main Bearings (two halves)	1.20	1.60	2.35	4.10	4.40	5.40
47B12	Connecting Rod Bearings (two halves)	.98	1.20	1.75	2.30	2.85	3.75
47B15	Exhaust Valve Lever	.45	.53	.60	.68	.75	.90
47B18	Cam Gear	2.25	3.00	3.75	5.90	6.10	6.35
47B19	Crank Shaft Pinion	1.00	2.50	3.15	3.45	4.10	4.70
47B20	Governor Pinion	.55	.55	.55	.55	.55	.55
47B21	Governor Bracket	1.05	1.90	1.90	1.90	1.90	1.90
47B22	Detent Lever	.35	.65	.65	.65	.65	.65
47B25	Igniter Trip Bracket	...	.95	...	...	...	...
47B27	Igniter Trip Lever	...	.65	...	...	...	...
47B28	Governor Ball	.25	.25	.25	.25	.25	.25
47B30	Governor Spindle	.95	1.40	1.40	1.40	1.40	1.40
47B33	Movable Electrode	1.20	1.20	1.20	1.20	1.20	1.20
47B34	Igniter Anvil	.10	.38	.38	.38	.38	.38
47B35	Igniter Trip	.40	.56	.56	.56	.56	.56
47B36	Valve Lever Adjusting Screw	.16	.16	.16	.16	.16	.16
47B40	Cap for Main Bearing	.70	1.25	1.65	1.90	2.45	2.65
47B41	Muffler Cap	.60	1.13	1.35	1.35	2.03	2.03
47B42	Muffler Body	1.00	1.65	2.03	2.33	2.85	3.75
47B44	Street Ell for Exhaust	.25	.40	.90	.90	1.50	2.00
47B49	Valve Lock Lever	...	...	.15	.15	.23	.23
47B50	Valve Lock Stud with Nut and Cotter	...	...	.15	.15	.15	.15
47B51	Valve Lock Spring	...	...	.12	.14	.14	.14
47B57	Gasoline Inlet Pipe	.15	.25	.25	.25	.25	.25
47B58	⅜-Inch Pipe Cap for Fill Pipe	.13	.13	.13	.13	.13	.13
47B64	Igniter Studs, each	.20	.20	.20	.20	.20	.20
47B66	Mica Washers, set	.13	.13	.13	.13	.13	.13
47B67	Locknut for Insulated Electrode	.08	.08	.08	.08	.08	.08
47B68	Igniter Tension Spring	.15	.15	.15	.15	.15	.15
47B69	Igniter Trip Spring	.15	.15	.15	.15	.15	.15
47B70	Binding Nut Insulated Electrode	.10	.10	.10	.10	.10	.10
47B71	Binding Nut Non-insulated Electrode	.10	.10	.10	.10	.10	.10
47B72	Igniter Packing	.15	...	...	...	...	...
47B73	Stationary Electrode	.65	.65	.65	.65	.65	.65
47B74	Exhaust Valve Spring	.15	.15	.15	.23	.23	.23
47B75	Intake Valve Spring	.15	.15	.15	.25	.25	.25
47B76	Exhaust Valve Lever Pin with nut	.12	.15	.15	.24	.24	.24
47B78	Cylinder Head Stud	.35	.45	.45	.60	.70	.70
47B81	Cylinder Head Packing	.53	.55	.80	1.13	1.43	1.88
47B82	Governor Ball Spring	...	.10	...	...	...	...
47B83	Governor Spindle Spring	.12	.12	.12	.12	.12	.12
47B84	Detent Lever Spring	.09	.09	.09	.09	.09	.09
47B88	Cap Screw for Governor Bracket	.15	.15	.15	.15	.15	.15
47B89	Detent Blade	.25	.25	.25	.25	.25	.25
47B90	Detent Cap Screw with Washer	...	.10	.10	.10	.10	.10
47B91	Gear Pin Set Screw and Locknut	.15	.15	.15	.15	.15	.15
47B92	Detent Lever Pin	.20	.20	.20	.20	.20	.20
47B93	Governor Spindle Rod	.25	.40	.40	.40	.40	.40
47B93A	Igniter Trip and Governor Bracket Plate	...	.32	.32	.32	.32	.32
47B95	Igniter Trip Lever Bracket Plate Screw	...	.10	.10	.10	.10	.10
47B97	Cam Gear Pin	.25	1.50	1.50	1.75	1.75	1.75
47B98	Governor Ball Pin with Cotter	.09	.12	.12	.12	.12	.12
47B103	Cam Rod Spring	.12	.12	.12	.12	.12	.12

NOTE—Heavier parts marked (*) will be shipped by freight, prepaid. All other parts are shipped by prepaid parcel post.

Be Sure When Ordering to Give the Horse-Power and Number of Your Engine.

Part No.	Name of Part	1½ H.-P.	2 H.-P.	4 H.-P.	6 H.-P.	8 H.-P.	10 H.-P.
47B104	Cam Roller	$0.23	...	...	...	...	...
47B105	Detent Catch	.30	$0.30	$0.30	$0.30	$0.30	$0.30
47B106	Detent Catch Screw	.08	.08	.08	.08	.08	.08
47B107	Cam Roller Stud	.15	.15	.15	.15	.15	.15
47B109	Igniter Trip Bracket Locknut	...	.05	...	...	...	...
47B110	Locknut for Cam Roller	.06	.06	.06	.06	.06	.06
47B113	Cam Rod	1.35	1.60	1.70	1.75	2.00	2.45
47B115	Detent Adjusting Screw	.12	.12	.12	.12	.12	.12
47B116	Hopper Bolt and Washer	.10	.10	.10	.10	.10	.10
47B118	Exhaust Pipe	.15	.38	.45	.50	.56	.65
47B119	Cylinder Cap Screw	...	.15	.15	.20	.20	.20
47B120	Piston Pin	.53	.75	.95	1.25	1.50	1.75
47B121	Piston Ring	.38	.50	.60	.68	.75	.98
*47B122	Crank Shaft	6.25	9.80	14.70	36.85	40.00	45.00
47B123	Crank Shaft Pinion Key	.15	.15	.15	.15	.15	.15
47B124	Key for Fly Wheel	.15	.15	.15	.20	.23	.23
47B126	Main Bearing Stud	.30	.35	.35	.50	.50	.50
47B127	Conecting Rod Stud	.30	.55	.55	.75	.85	.90
47B128	Set Screw with Locknut for Piston Pin	.10	.10	.10	.15	.15	.15
47B130	Connecting Rod Grease Cup	.38	.75	.95	1.15	1.15	1.15
47B131	Main Bearing Grease Cup	.15	.50	.56	.65	.82	.82
47B132	Connecting Rod Bushing	.45	.80	1.20	1.30	1.70	2.10
47B154	Mixing Valve Complete	5.90	6.95	9.30	10.70	10.70	10.70
47B159	Main Bearing Stud Nut	.05	.10	.10	.10	.10	.10
47B160	Cylinder Head Stud Nut	.05	.10	.10	.10	.10	.10
47B162	Connecting Rod Stud Nut	.05	.10	.10	.10	.10	.10
47B164	Igniter Stud Nut	.05	.10	.10	.10	.10	.10
47B165	Exhaust Lever Stud Nut	...	.05	...	...	...	...
47B166	Muffler Bolt	.05	.05	.05	.05	.05	.05
47B218	Valve for Mixer	.82	.82	.82	.95	1.20	1.20
47B219	Valve Spring	.15	.15	.15	.15	.15	.15
47B220	Dial Pointer	.20	.20	.20	.20	.20	.20
47B221	Shut Off Dial	.45	.45	.45	.45	.45	.45
47B222	Thin Brass Nut	.10	.10	.10	.10	.10	.10
47B223	Mixer Body	1.35	2.20	2.50	2.85	3.45	3.75
47B224	Mixer Body Cap	.70	.95	1.15	1.15	1.60	1.70
47B225	Brass Packing Nut	.32	.32	.32	.32	.32	.32
47B226	Brass Union	.25	.25	.32	.32	.45	.45
47B227	Cotter Pin	.05	.05	.05	.05	.05	.05
47B228	Brass Washer	.05	.05	.05	.05	.05	.05
47B229	Brass Bushing	.15	.23	.23	.23	.23	.23
47B964	Igniter Trip Bracket Set Screw	.05	...	.05	.05	.05	.05
47B983	Igniter Trip Lever Spring	.06	.06	.06	.06	.06	.06
47B990	Igniter Trip Bracket Pin	.10	.10	.10	.10	.10	.10
47B992	Igniter Trip Bracket	.35	...	.95	.95	.95	.95
47B993	Igniter Trip Blade	.12	...	.20	.20	.20	.20
47B994	Igniter Trip Blade Adjusting Screw	.06	...	.06	.06	.06	.06
47B1001	Igniter Anvil Stop Pin	.10	.10	.10	.10	.10	.10
47B1002	Igniter Trip Lever	.15	...	.25	.25	.25	.25
47B1018	Gasoline Inlet Pipe to Mixer with Nuts	.35	.56	.56	.65	.65	.65
47B1041	Igniter Trip Blade Locknut	.05	...	.05	.05	.05	.05

When ordering parts for mixing valve, be sure to give name on the mixer, Essex or Lunkenheimer.

Engine Parts Not Illustrated.

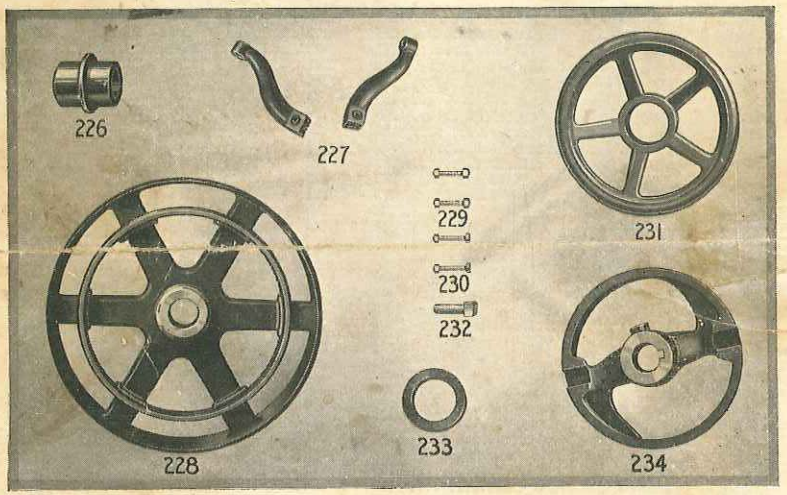
Part No.	Name of Part	1½ H.-P.	2 H.-P.	4 H.-P.	6 H.-P.	8 H.-P.	10 H.-P.
*47B3	Base (we do not furnish)	...	...	...	...	...	...
*47B4	Cylinder	...	$12.75	$17.00	$23.25	$33.90	$44.00
*47B5	Water Hopper	...	6.85	9.70	14.55	15.80	23.50
47B13	Water Hopper Lid	...	.32	.40	.45	.50	.56
*47B14	Cylinder Head, only	$5.25	10.85	13.95	16.15	*16.80	*19.00
*47B14A	Cylinder Head complete with Springs and Valves	5.90	11.80	14.90	17.00	*17.75	*19.90
*47B16	Fly Wheel	6.25	12.00	19.50	27.75	45.00	61.00
47B43	Starting Crank	1.00	1.50	1.50	1.60	...	...

NOTE—Heavier parts marked (*) will be shipped by freight, prepaid. All other parts are shipped by prepaid parcel post.

Engine Parts Not Illustrated—Continued.

Part No.	Name of Part.	1½ H.-P.	2 H.-P.	4 H.-P.	6 H.-P.	8 H.-P.	10 H.-P.
47B55	Gasoline Tank	$2.25	$2.80	$3.55	$3.70	$4.45	$5.00
47B125	Tank Rod	.20	.20	.20	.20	.20	.20
47B133	Cylinder Lubricator	1.95	2.10	2.10	2.40	2.75	2.75
47B134	Cylinder Lubricator Glass	.45	.53	.53	.60	.68	.68
47B136	Drain Cock	.65	.65	.65	.65	.65	.65
47B152	Igniter Wrench	.65	.65	.65	.65	.65	.65
47B156	Pulley Key	.15	.23	.23	.40	.45	.45
47B157	Pulley Set Screw	.05	.05	.05	.05	.05	.05
47B191	Spark Coil and Switch	1.75	1.75	1.75	1.75	1.75	1.75
47B195	Battery Wire	.32	.32	.32	.32	.32	.32
47B216	Igniter Complete	4.30	4.40	4.40	4.40	4.40	4.40
47B507	Stationary Electrode Point	.15	.15	.15	.15	.15	.15
47B514	Movable Electrode Point	.15	.15	.15	.15	.15	.15
47B1172	Detent Locknut Complete with Washer	.20	.20	.20	.20	.20	.20
47B1361	Governor Bracket Dowel Pin	.09	.09	.09	.09	.09	.09
47B1364	Governor Complete	5.30	8.00	8.00	8.00	8.00	8.00

Repairs for Friction Clutch Pulleys.



Be Sure to Give Size of Engine and Pulley the Parts Are For.

Size, Inches	No. *47B234 Friction	No. 47B227 Dogs, per Pair	No. *47B231 Hand Wheel	No. 47B226 Cam	Nos. 47B229 and 47B230 Screws, Each	No. 47B233 Collar, Each	No. 47B232 Set Screw, Each
8x4½	$10.00	$1.50	$1.50	$2.25	30c	75c	18c
10x4½	10.00	1.50	1.50	2.25	30c	75c	18c
10x6	10.00	1.50	1.50	2.25	30c	75c	18c
12x4½	10.00	1.50	1.50	2.25	30c	75c	18c
12x6	10.00	1.50	1.50	2.25	30c	75c	18c
14x4½	10.00	1.80	2.00	2.50	30c	75c	18c
14x6	10.00	1.80	2.00	2.50	30c	75c	18c
16x6	10.00	1.80	2.00	2.50	30c	75c	18c
18x6	10.00	1.80	2.00	2.50	30c	75c	18c
20x6	10.00	1.80	2.00	2.50	30c	75c	18c

NOTE—Heavier parts marked (*) will be shipped by freight, prepaid. All other parts are shipped by prepaid parcel post.