

L. P. L.

THE HOWARD PATENT ROTARY HOE SIX

Hints on Working—Instructions
for Adjustment and Lubrication
also Illustrated List of Parts

MANUFACTURED BY
ROTARY HOES, LIMITED,
EAST HORNDON, ESSEX.

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ROTARY HOES, LIMITED.

GUARANTEE

We undertake to supply free of charge, new parts in place of parts which break or wear excessively through faulty material or bad workmanship within six months after delivery, provided such faulty parts are returned to us, carriage paid, for examination; but we are not liable for labour, or any loss or damage direct or consequential nor responsible for any accident or in any way for the effect of any accident, whether due to defective material, workmanship or otherwise misuse or neglect, including the use of unsuitable or dirty lubricants or fuels, or by interference with the construction of the machine as completed by the manufacturers. In the case of equipment or parts not manufactured by Messrs. Rotary Hoes, Limited, the above warranty shall not apply, and the purchaser shall be only entitled to rely on the same warranty against us as is given by the manufacturer of such equipment or parts.

INSTRUCTIONS FOR OPERATING The Howard Roteho "Six."

THE ROTEHO "SIX."

The Howard Roteho "Six" has been designed to meet the requirements for tilling Market Gardens, Orchards, Vineyards, etc., and all agricultural work on a medium scale, which requires that the land be thoroughly tilled. It is also a most efficient implement for working cover crops into the soil for green manure.

SPECIAL ATTACHMENTS ARE AVAILABLE FOR MANY PURPOSES.

Furrowing attachment, for opening drills for planting row crops or storm water drains, etc.; furrow covering attachment, hilling attachment for hilling any kind of row crops; also for working exceptionally hard ground.

The Rotary Hoe "Six" is manufactured in three sizes: 20 inch cut as standard; 24 inch cut; and 18 inch cut for special work.

STARTING.

This is done from the right hand side of the machine looking forward. First, turn on the petrol—the tap is underneath the petrol tank—then flood the carburettor and retard the ignition. Then place the starting handle in position, raise the exhaust valve lifter—this is fitted beneath the main control member of the Roteho just in front of the depth regulating mechanism—and swing the engine briskly, dropping the exhaust lifter while turning; when engine starts, withdraw starting handle and advance magneto. If the engine does not start, consult the trouble chart in Engine Handbook.

COMMENCING WORK.

All controls are easily reached from the handle bars. The clutch lever is on the left, the throttle on the right. Raising this opens, lowering it closes the throttle. To travel to work, raise the rotor clear of the ground by pushing the depth lever right forward, and engage top gear. This enables you to walk at a comfortable pace without racing the engine. When ready to commence tillage, draw the depth lever up to the depth you require to work, disengage the clutch, engage the travel and rotor gear required, let the clutch in and open throttle simultaneously to enable the engine to take the load.

GEARS.

The Roteho "Six" is fitted with four-speed gear box and two independent speeds to the rotor.

TILLAGE.

In the Roteho system of tilling the ground, the rotor which tills the soil consists of a number of cutting blades which operate in a similar way to an ordinary hoe. These blades are attached to flanges on a

tubular spindle, and are revolved by power applied direct from the engine. The thrust by the resistance of the ground against the blades assists in propelling the machine. As the rotor revolves the blades are forced into the ground, cutting out the soil in small pieces, and as they move to the rear and rise to the surface they pulverise and mix the soil.

The degree of fineness required is obtained by varying the travel speed, that is, by changing the travel gear until the desired effect is obtained.

FURROWING.

The furrowing attachment is fitted in the place of the depth wheel. To fix, release the depth wheel pedestal, which is held in position by a spring loaded clip below the depth regulating handle, and press the retaining pin to the right. The depth wheel will drop out and the furrowing attachment depth skid is fitted into its place. The furrowing attachment is used in conjunction with the rotor and moulds up the tilled soil. The relation of depth of furrow with cutting depth of rotor is determined by moving the furrowing mould boards up or down the depth control skid.

FURROW COVERING.

The furrow covering attachment is fitted in the same manner as the furrowing attachment. When in operation the Roteho runs along the ground on its wheels and the rotor, the latter being left in neutral and the attachment draws the soil together, leaving the ground level.

HILLING.

The hilling and attachment bar fit behind the rotor to which the hilling mould boards are attached, in the required position to suit work in progress. The attachment bar is so designed that many kinds of tools can be fitted.

LUBRICATION.

ENGINE.

Use only high quality oil suitable for air cooled engines, about the same grade as: Castrol G.P. or C, Modiloil B, Golden Shell, Atlantic Heavy.

Fill the oil tank to within one inch from the return pipe inside tank; remove oil filler cap frequently and see the oil is circulating through while engine is running. If oil should drop below one-third full, fresh oil must be added.

At the end of every 24 hours' running, drain oil out of tank, taking out strainer, and core in filter, and washing in paraffin; also drain out of crankcase.

If the oil should show signs of dirt in it, rinse tank and sump with paraffin.

Be sure that the paraffin is drained out before putting in fresh oil.

GEAR BOX.

Use only good quality medium gear oil in the gear box and Rotor gear box similar to Castrol D, etc. The filler hole for the gear box is situated on the top of the box. The oil level in the box can be ascertained by means of a dip stick and should be maintained between 2 in. to 2½ in. from the bottom.

CLUTCH THRUST BEARING.

Remove inspection plate in clutch housing and turn engine until copper oil pipe can be seen; oil with engine oil, using oilcan provided, and replace cover. This should be done after every 24 hours' running.

CHAIN CASE.

Similar gear oil must be used for the chain case as for the gear box. The filler hole is on the top of the chain case. The level can be ascertained by means of a dip stick, and 2 in. of oil in the case is sufficient.

STUB AXLE.

Remove round headed screw through hole in dust cover and fill with engine oil after every 24 hours running.

DEPTH CONTROL WHEEL.

Remove round headed screw in wheel boss and oil daily.

ADJUSTMENTS.

If the best results are to be obtained, the following points must receive regular attention:

PETROL FILTER.

Open drain cock every few days before starting the engine up, to clear any water which may have settled. If the drain cock should get blocked, insert a wire to clean the passage.

ENGINE CLUTCH.

The clutch should always be adjusted with a little play on lever so that the thrust bearing is free, except when the hand lever is lifted.

GENERAL.

Care must be taken to keep all working parts properly lubricated, all nuts and screws tightened up, and everything adjusted. This also applies to cylinder head holding down bolts on a new engine.

ROAD WHEELS.

The road wheels are frictionally driven by a separate clutch on the centre of each wheel, which is adjusted by the four nuts around the centre plates. These should be kept screwed up tight enough to pull the machine wherever it is required, but still be free enough to slip in the event of a jam between wheels and frame occurring.

CARBURETTOR.

To adjust the carburettor, screw needle in jet, bolt up, but not too tight, then unscrew half a turn. Open throttle slightly, start engine and close throttle to stop screw. If necessary, adjust idling air adjusting screw until engine runs smoothly. Turn this screw inwards to make the mixture richer and outwards for a lean mixture. Adjust main jet adjusting screw as lean as possible (by screwing upwards) to get quick and even acceleration and smooth running when throttle is operating.

It is sometimes necessary to open main jet screw when starting in cold weather, closing it as lean as possible to get economical working after engine warms.

To clean the carburettor jet it is necessary to take out main jet bolt through which the main jet adjusting screw operates. The idling jet is a very small hole drilled in the groove half-way up the jet bolt. It can be cleaned out with a fine wire.

HOES.

Examine hoes daily. If any are bent out of line so that the back of the blade is rubbing hard on the soil, straighten them up with the hooked bar provided.

It is essential that the cutting edge only should rub in the soil and the back have a clearance. If the edge of the blade should tend to turn inwards, leaving a heavy shoulder rubbing on the ground, this can be rectified by placing the end of the blade setting bar behind the blade and tapping the edge back into position.

The efficiency of the machine depends largely on the condition of the hoes. If the hoes get bent through striking solid obstacles in the ground and are not straightened up, they will require twice the power to drive, the quality of the work will be poor, and the blades will wear out quickly. Trouble will also be experienced with clogging under the shield; therefore, a keen lookout should be kept for bent hoes, which should be straightened as soon as they are noticed.

SAFETY CLUTCH.

To prevent the possibility of the machine being damaged through the rotor becoming locked by roots and stone picking up on the blades and jamming between the blades and frame, a safety clutch is provided at the drive end of the rotor. This is purely a friction clutch and should always be screwed up tight enough to hold engine and force the blades through any hard ground required to cultivate, but not screwed up dead tight. It is essential to see that this clutch is not slipping, except when obstructed as above, as the quality of the work will be greatly reduced and considerable wear will take place.

For Engine adjustment consult Engine Handbook.

STANDARD EQUIPMENT.

Oilcan.

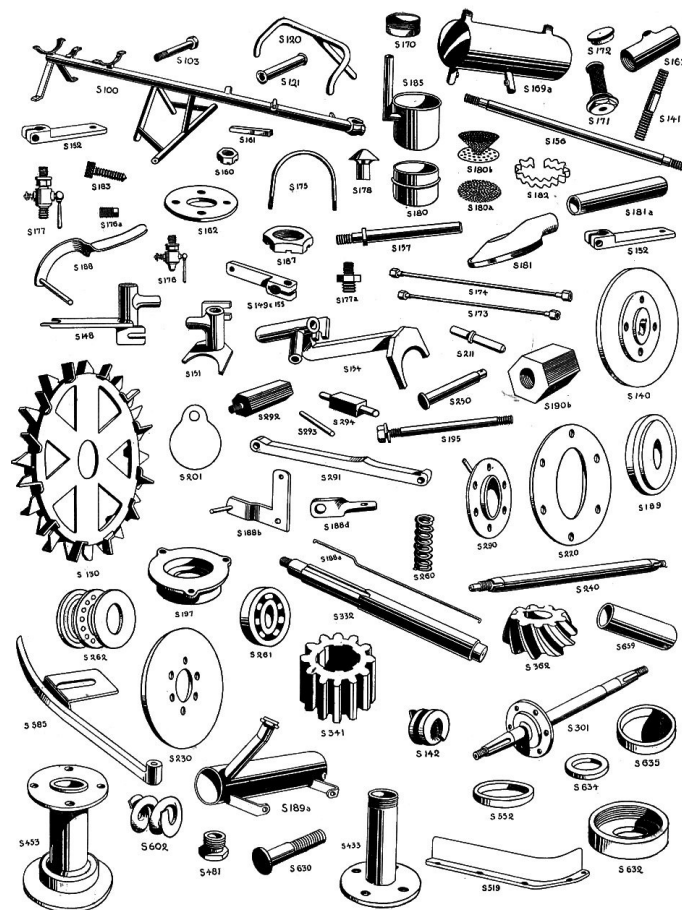
Screwdriver.

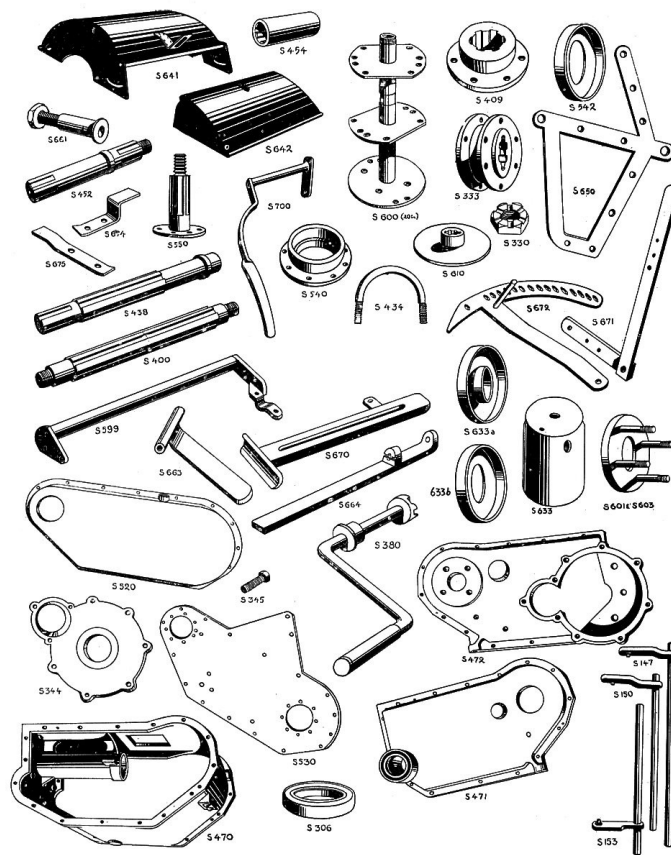
4 Spare Blades (2 Right and 2 Left Hand).

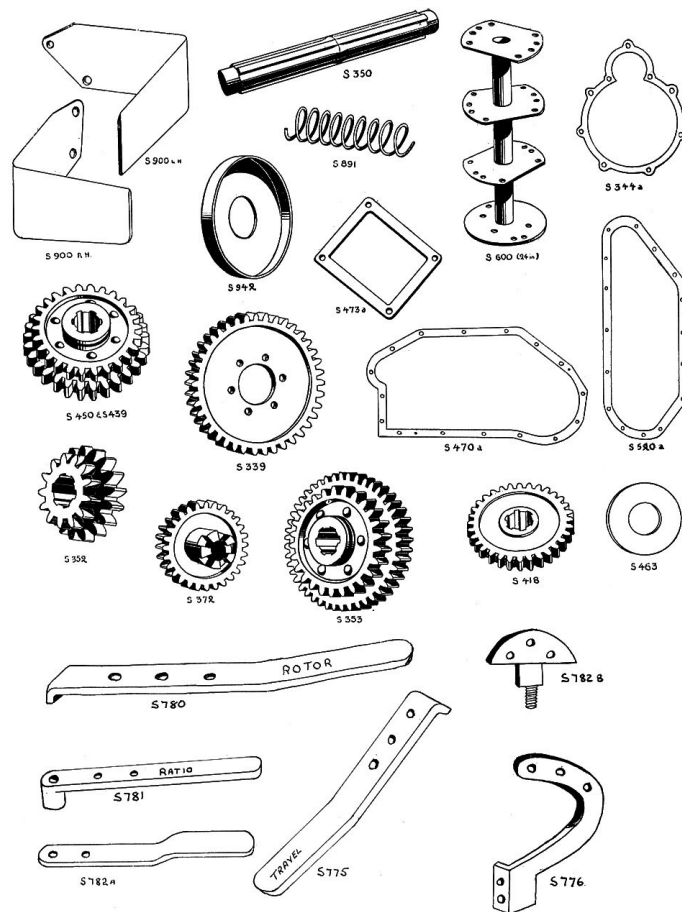
Set of Spanners.

Assortment of Nuts, Spring Washers, Split Pins and Bolts.

Blade Setting Bar.







PARTS LIST "S."

| Part No. | Part Name. |
|----------|---|
| 100. | Frame (state width of machine). |
| 103. | Hand grip bolt. |
| 120. | Handles. |
| 121. | Handle grips. |
| 130. | Road wheels. |
| 140. | Road wheel hubs. |
| 141. | Road wheel studs. |
| 142. | Road wheel studs spring washers. |
| 147. | Ratio change shaft. |
| 148. | Ratio gear selector. |
| 149. | Ratio gear arm. |
| 150. | Travel speed change shaft. |
| 151. | Travel speed change selector. |
| 152. | Travel speed change arm. |
| 153. | Rotor change shaft. |
| 154. | Rotor gear selector. |
| 155. | Rotor gear arm. |
| 156. | Gear selector slide rod, long. |
| 157. | Gear selector slide rod, short. |
| 160. | Road wheel shaft nuts. |
| 161. | Road shaft keys. |
| 162. | Road wheel hub disc. |
| 169. | Petrol and oil tank filter casting. |
| 169a. | Petrol and oil tank. |
| 170. | Petrol filler casting. |
| 170a. | Oil filler casting. |
| 171. | Oil and Petrol filter. |
| 172. | Petrol and oil tank caps. |
| 173. | Petrol pipe. |
| 174. | Oil pipe. |
| 175. | Petrol and oil tank straps. |
| 175a. | Petrol and oil tank strap nuts. |
| 176. | Petrol and oil drain cocks. |
| 176a. | Oil tank filter core plug. |
| 177. | Petrol and oil stop cocks. |
| 178. | Air cleaner inlet pipe cap. |
| 180. | Air cleaner horsehair container. |
| 180a. | Air cleaner horsehair container perforated plate. |
| 181. | Air cleaner cover. |
| 181a. | Air cleaner cover hose. |
| 182. | Air cleaner horsehair container clips. |
| 183. | Air cleaner cover clamping screw. |
| 185. | Air cleaner tank. |
| 187. | Exhaust muffler end plate nuts. |
| 187a. | Exhaust muffler tube. |
| 188. | Exhaust valve lifting lever. |
| 188a. | Exhaust valve lifting rod. |
| 188b. | Exhaust valve lifting bracket. |
| 188c. | Exhaust valve lifting bracket bolts. |
| 188d. | Exhaust valve lifting holder. |
| 189. | Exhaust muffler end plates. |
| 189a. | Exhaust muffler. |
| 190. | Flywheel. |

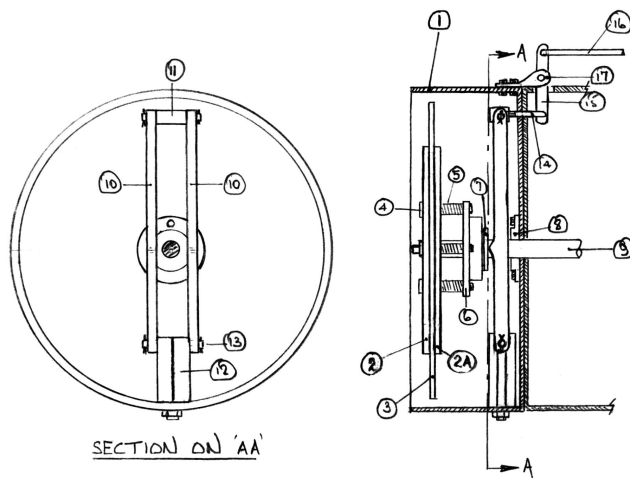
| Part No. | Part Name. |
|----------|---|
| 190a. | Flywheel key. |
| 190b. | Flywheel nut. |
| 191. | Flywheel housing. |
| 192. | Cooling blast shroud. |
| 193. | Cooling blast shroud base plate. |
| 194. | Cooling blast shroud screws. |
| 195. | Engine support studs, nuts and springs washers. |
| 196. | Engine oil seal housing screws. |
| 197. | Engine oil seal housing. |
| 198. | Engine gitseal. |
| 200. | Clutch housing. |
| 201. | Clutch housing inspection plate. |
| 202. | Clutch housing inspection plate screws. |
| 203. | Clutch housing bolts and washers. |
| 211. | Clutch pins for flywheel. |
| 220. | Clutch friction plate. |
| 230. | Clutch friction plate, loose. |
| 240. | Clutch shaft. |
| 240a. | Clutch plate fixed. |
| 242. | Clutch plate keys. |
| 243. | Clutch plate nut. |
| 250. | Clutch pins for springs. |
| 260. | Clutch springs. |
| 261. | Clutch spigot bearing LS5. |
| 262. | Clutch thrust race W $\frac{7}{8}$. |
| 290. | Clutch thrust race housing. |
| 291. | Clutch compression bars. |
| 292. | Clutch compression bar bracket. |
| 293. | Clutch compression bar pin. |
| 294. | Clutch compression bar trunnion nut. |
| 295. | Clutch shaft bearing MS9. |
| 296. | Clutch shaft gitseal $\frac{7}{8}$ dia. |
| 300. | Road wheel shaft bearing LS12. |
| 301. | Road wheel shaft. |
| 302. | Road wheel drive gear. |
| 303. | Road wheel drive rivets. |
| 306. | Road wheel shaft gitseal. |
| 330. | Differential shaft nut. |
| 331. | Differential shaft bearing LS10. |
| 332. | Differential shaft. |
| 333. | Differential wheel spacer. |
| 334. | Differential wheel, small. |
| 335. | Differential wheel rivets. |
| 339. | Differential wheel, large. |
| 341. | Bull pinion. |
| 344. | Bull wheel side plate. |
| 344a. | Bull wheel side plate gasket. |
| 345. | Bull wheel side plate screws. |
| 350. | Layshaft. |
| 351. | Layshaft bearing. |
| 352. | Change speed pinion. |
| 353. | Ratio change gear, small. |
| 353a. | Ratio change gear, large. |
| 354. | Ratio change gear rivets. |
| 362. | Bevel pinion. |
| 363. | Bevel pinion key. |
| 364. | Bevel pinion nut. |

| Part No. | Part Name. |
|----------|---------------------------------------|
| 365. | Bevel crown wheel. |
| 371. | Power take-off bush. |
| 372. | Hand starting gear and dog. |
| 380. | Starting handle. |
| 381. | Starting handle bush. |
| 400. | Primary shaft. |
| 401. | Primary shaft nut. |
| 402. | Primary shaft bearings, LS.10. MS.10. |
| 404. | Spacing collar. |
| 405. | Spacing collar. |
| 407. | Spacing collar. |
| 408. | Jackshaft drive gear, small. |
| 409. | Crown wheel hub. |
| 410. | Jackshaft drive gear, large. |
| 411. | Low ratio drive gear. |
| 416. | Bevel crown wheel rivets. |
| 418. | Power take-off drive gear. |
| 431. | Power take-off shaft bearing MS.7. |
| 433. | Power take-off shaft housing. |
| 434. | Power take-off shaft "U" bolt. |
| 436. | Power take-off shaft housing bolts. |
| 437. | Jackshaft bearing LS.10. |
| 438. | Jackshaft. |
| 438a. | Jackshaft dust cover. |
| 439. | Rotor gear, large. |
| 439a. | Rotor gear rivets. |
| 440. | Starting bearing housing. |
| 441. | Starting bearing housing screw. |
| 450. | Rotor gear, small. |
| 452. | Chain drive shaft. |
| 453. | Chain drive shaft housing. |
| 454. | Chain drive shaft sleeve. |
| 459. | Chain drive shaft bearing MS.10. |
| 460. | Chain drive sprocket. |
| 461. | Chain drive sprocket nut. |
| 463. | Oil seal disc road wheel shaft. |
| 464. | Oil seal disc jackshaft. |
| 470. | Gear box casting. |
| 470a. | Gear box gasket. |
| 471. | Gear box side plate casting, L.H. |
| 472. | Gear box side plate casting, R.H. |
| 473. | Inspection plate. |
| 473a. | Inspection plate gasket. |
| 474. | Inspection plate screws. |
| 481. | Gear change shaft bush. |
| 519. | Rotor drive box wearing shoe. |
| 520. | Rotor drive box cover. |
| 520a. | Rotor drive box gasket. |
| 521. | Rotor drive box oil plug. |
| 523. | Rotor drive box screws and washers. |
| 530. | Rotor drive box plate. |
| 540. | Rotor drive bearing housing. |
| 541. | Rotor drive bearing stop. |
| 541a. | Rotor drive bearing stop screws. |
| 542. | Rotor drive bearing dust cover. |
| 543. | Rotor drive housing rivets. |
| 550. | Rotor drive shaft. |

| Part No. | Part Name. |
|----------|--|
| 551. | Rotor drive chain. |
| 551a. | Rotor drive chain connecting link. |
| 551b. | Rotor drive shaft bearing LS.330. |
| 552. | Rotor drive shaft spacing sleeve. |
| 560. | Rotor drive sprocket. |
| 561. | Rotor drive sprocket rivets. |
| 585. | Rotor drive chain skid. |
| 586. | Rotor drive chain skid screws. |
| 589. | Rotor stay tube. |
| 589a. | Rotor stay tube set screws and washers. |
| 600. | Rotor (state width). |
| 600a. | Rotor oiling plug. |
| 601. | Rotor friction drive plate. |
| 602. | Rotor friction drive springs. |
| 603. | Rotor friction drive studs. |
| 610. | Rotor friction drive disc. |
| 612. | Rotor friction drive disc nut. |
| 615. | Rotor drive disc gitseal. |
| 630. | Rotor stub axle and nut. |
| 631. | Rotor stub axle bearing MS.7. |
| 632. | Rotor stub axle bearing cap. |
| 633. | Rotor stub axle bearing dust cover. |
| 633a. | Rotor stub axle dust cover, large, 24" machine only. |
| 633b. | Rotor stub axle dust cover, small, 24" machine only. |
| 634. | Rotor stub axle spacing sleeve. |
| 635. | Rotor stub axle back plug. |
| 636. | Rotor stub axle gitseal. |
| 637. | Rotor stub axle gitseal holder. |
| 641. | Rotor shield front part. |
| 642. | Rotor shield rear part. |
| 643. | Rotor shield screws, nuts and washers. |
| 650. | Rotor support bracket, right. |
| 651. | Rotor support bracket screws. |
| 658. | Rotor depth control wheel spacing collar. |
| 659. | Rotor depth control wheel bush. |
| 660. | Rotor depth control wheel. |
| 661. | Rotor depth control wheel axle and nut. |
| 662. | Rotor depth wheel axle cap. |
| 663. | Rotor depth control wheel arm. |
| 664. | Rotor depth control wheel pedestal. |
| 665. | Rotor depth control wheel axle cover. |
| 666. | Rotor depth control wheel pedestal pin. |
| 667. | Rotor depth control socket support to frame. |
| 670. | Rotor depth control socket. |
| 671. | Rotor depth control lever. |
| 672. | Rotor depth control quadrant. |
| 674. | Rotor depth control socket clip. |
| 675. | Rotor depth control quadrant clip. |
| 676. | Rotor depth quadrant spring. |
| 677. | Rotor depth control socket bolts. |
| 678. | Rotor depth control lever bolt. |
| 700. | Clutch hand lever. |
| 701. | Clutch and throttle hand lever pin. |
| 702. | Clutch hand control connection rod. |
| 703. | Clutch hand control connection adjustment nut. |
| 710. | Clutch lever. |
| 711. | Clutch fulcrum bracket. |

| Illus. | | | |
|------------|-----------------|--------------------------------------|----------------|
| <u>No.</u> | <u>Part No.</u> | <u>Part Description</u> | <u>No. Off</u> |
| 1 | 200 | Clutch housing | 1 |
| 2 | 230 | Clutch plate, loose | 1 |
| 2A | 240A | Clutch plate, fixed | 1 |
| 3 | 220 | Clutch friction plate | 1 |
| 4 | 250 | Clutch pins | 6 |
| 5 | 260 | Clutch springs | 6 |
| 6 | 290 | Clutch thrust race housing | 1 |
| 7 | 262 | Clutch thrust race $\frac{W}{8}$ " | 1 |
| 8 | 197 | Oilseal housing | 1 |
| 8A | 198 | Oilseal | 1 |
| 9 | 240 | Clutch shaft | 1 |
| 10 | 291 | Clutch compression bars | 2 |
| 11 | 294 | Clutch compression bars trunnion nut | 1 |
| 12 | 292 | Clutch compression bar bracket | 1 |
| 13 | 293 | Clutch compression bar pin | 1 |
| 14 | 720 | Clutch adjusting push rod | 1 |
| 15 | 710 | Clutch lever | 1 |
| 16 | 702 | Connecting rod | 1 |
| 17 | 711 | Clutch fulcrum bracket | 1 |

HOWARD PHOTO HOF SIX
PROBABLE CLUTCH ARRANGEMENT



| Part No. | Part Name. |
|----------|--|
| 712. | Clutch fulcrum bracket screws. |
| 720. | Clutch adjusting push rod. |
| 752. | Gear control rod bracket. |
| 755. | Gear control rod (travel). |
| 753. | Gear control rod bracket bolts and nuts. |
| 754. | Gear control rod (rotor). |
| 770. | Change speed control cross joint. |
| 771. | Change speed control cross joint pin. |
| 772. | Change speed lever connecting rod trunnion nut. |
| 773. | Change speed lever connecting link rod. |
| 774. | Gear control rod arm. |
| 775. | Travel gear hand lever. |
| 776. | Travel and rotor gear quadrant. |
| 780. | Rotor gear hand lever. |
| 781. | Ratio gear hand lever. |
| 782a. | Ratio gear hand pin lever. |
| 782b. | Ratio gear quadron. |
| 783. | Rotor control collar. |
| 784. | Throttle hand control connecting rod. |
| 785. | Throttle hand control connecting rod to carburettor. |
| 786. | Throttle hand control lever. |
| 787. | Throttle fulcrum lever. |
| 788. | Throttle lever trunnion nut. |
| 790. | Tool box. |
| 820. | Weed cutter blade. |
| 825. | Weed cutter blade bracket. |
| 880. | Oil filter tube. |
| 881. | Oil filter tube end caps. |
| 881a. | Oil filter tube end caps. |
| 882. | Oil filter tube centre pipe. |
| 883. | Oil filter tube centre pipe locking screw. |
| 885. | Oil filter tube nipple. |
| 886. | Oil filter connecting union. |
| 887. | Oil filter pressure end lock washers. |
| 889. | Oil filter bag holding plate centre. |
| 890. | Oil filter bag. |
| 891. | Oil filter bag wire spring. |
| 900. | Ordinary hoe (state right or left hand). |
| 915. | Hoe bolts and washers. |
| 916. | Special bolts and washers. |
| 942. | Wearing plate on rotor drive. |
| 943. | Tow bar. |

WHEN ORDERING SPARES, PLEASE STATE MACHINE NUMBER
(STAMPED ON MAIN FRAME BEHIND PETROL TANK).

THE HOWARD PATENT ROTARY HOE is
manufactured in various sizes to meet all
agricultural needs, including tractor drawn models.
For further particulars apply to:—

ROTARY HOES, LIMITED,
STATION ROAD,
EAST HORNDON, ESSEX.

Telephone:
HERONGATE 26 and 96.

Telegrams:
"ROTOVATE, BRENTWOOD."