

# Ideal 900 Manual

## FOREWORD

The Model 900 Ideal Lawnmower Sharpener is designed for the lawnmower service operator who wants the ultimate in precision grinding combined with ease-of-operation, rugged long-life service, and the combination of "Hook" and "Straight Line" grinding methods. The Model 900 combines the best features of the Model 300 Ideal and the Model 600 Peerless. We are proud to offer this machine at such a reasonable price.

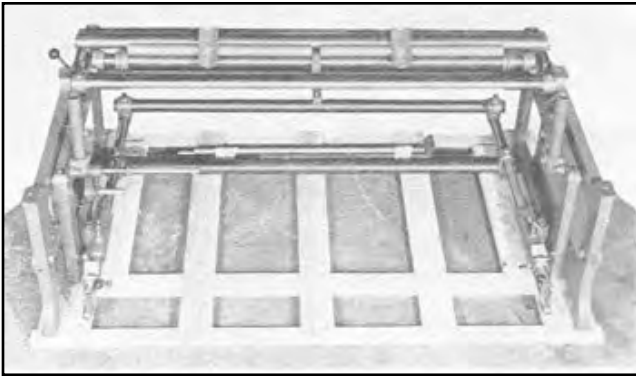


Fig.1

### PART 1 - ASSEMBLING INSTRUCTIONS

1. The Model 900 is shipped complete in one crate and it can be set up for operation in a few minutes. Figure 1 shows the Model 900 on its shipping base with the crate removed and the two cartons set aside. Remove all wires and tape used to secure the parts in shipment. Unfasten the side frames from the shipping base and place the upper structure on the floor.

2. Check all parts received for shipping damage. Unpack the two cartons and place parts on floor as shown in Figure 2. Refer also to Figure 6 for a complete checking the parts and the final assembly of the machine. Remove the capscrews which hold the

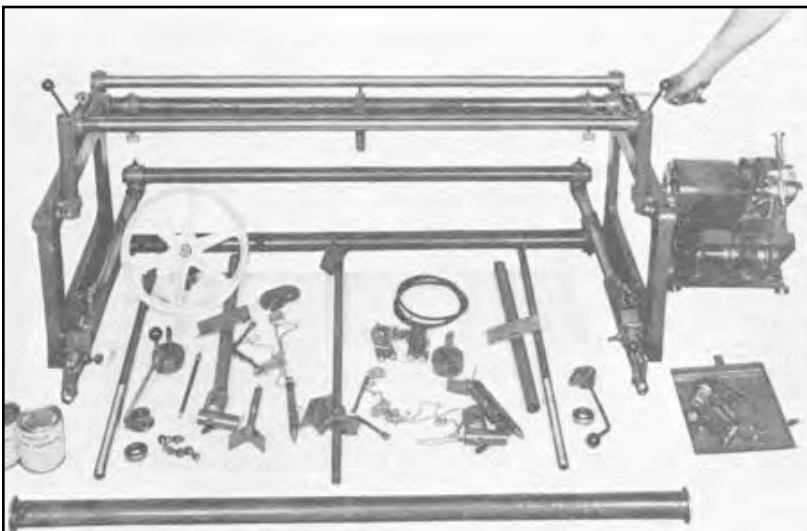


Fig. 2

grinding wheel carriage tracks in shipment as illustrated in Figure 2 (One in each end).

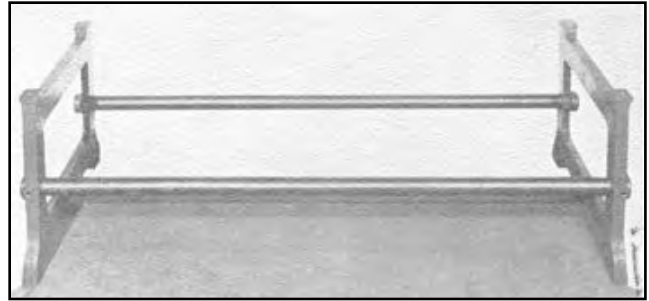


Fig. 3

3. Assemble the sub-base as shown in Figure 3 by inserting the pipes in each side frame. Tighten upper structure on the sub-base. Locate the sub some adjustment may be necessary in locating the the set screws just enough to hold the assembly, base assembly in the spot where you will use the machine if possible before completing the assembly. The Model 900 is heavy, built of rugged cast iron and steel, for long life.

4. Remove and discard the two short pipes used to hold the adjusting mower support in position during shipment.. (See Figure 2). These must be removed before the vertical adjusting screws can be inserted as in Figure 4. Place the upper structure on the assembled sub-base as necessary to insert the bolts, then place the machine in its permanent place of operation. The machine must be level for proper operation and it should be leveled before the sub-base pipes are tightened. Insert the P-417 vertical adjusting screw through the JD-71 bearing, then through the JD-16 pipe and into the P-431 knuckle casting of the mower support frame. The frame will be at its bottom position and the P-424 crank collar should be within V2" of the top of the P-417 screw. Push the screw down until the crank collar and bearing rest on the JD-16 pipe, then tighten the set screw in the mower support frame knuckle. This will allow full adjusting range. Repeat this procedure on the other end, refer to Figure 4. Insert the J-298 tool tray in the right end frame.

When unpacking the two cartons, arrange parts as shown at left in the approximate locations where they will be used. Remove all wires and tape and remove the two capscrews used in each side frame to hold the carriage tracks in shipment. (See hand in illustration removing the right side capscrew.) Check parts against Figure 2 and Figure 6. Report any missing parts or shipping damage immediately.

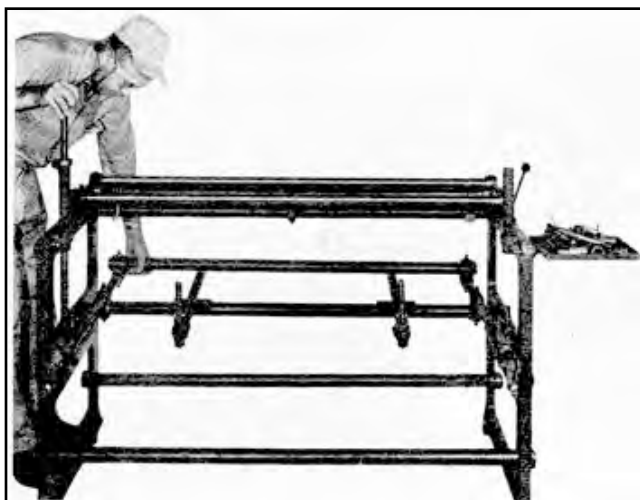


Fig. 4

5. With reference to Figures 4, 5, and 6, complete assembly by placing the mower support pipes in position as in Figure 4. Turn the J-339 cranks out for use as in Figure 6. The reconditioner attachment inserts into the left end frame. The JD-54 supports for the gravity feed fasten to the steel track linkage at either end with the chain and weights hooked up as shown in Figure 6. The grinding wheel carriage is complete and may be placed on the tracks as in Figure 6. Level the machine in both directions using the leveling bolts supplied for the sub-base legs, plug in the motor to a properly rated outlet and the Model 900 is ready for operation. Figure 5 shows how the bed knife grinding bar is installed for use in the mower support castings.

6. Damage in Shipment. Your Model 900 Ideal is covered by our guarantee which is printed on the back of this book. It does not cover anything damaged, broken or missing as a result of improper handling in shipment. Inspect the shipment, if damaged or loss is discovered, notify the agent for the carrier at once. Make out a claim and then order from us the parts needed to repair or replace the damage or loss. We charge you for these parts and you will be reimbursed for the amount of your claim by the carrier. The shipment, by law, becomes your property when it leaves our factory, only you can file a claim. Shipments by Express, Railroad or Truck are insured by the carrier and any damage or loss is covered, all you have to do is file a claim.

7. Lubrication. The necessity of lubrication has been minimized on your model No. 900 Grinder. All bearings used are of the anti-friction type life sealed, lubrication not required. The motor is sleeve bearing and requires no lubrication for the first two years, then V2 teaspoon light motor oil annually to each bearing. Instructions are on the motor cover plate. Oil other frictional points lightly, such as screw shafts, pivot joints,

etc. Remember that a mixture of emery dust and oil forms a cutting compound which will damage your machine. Excess oil should be removed when machine is in operation.

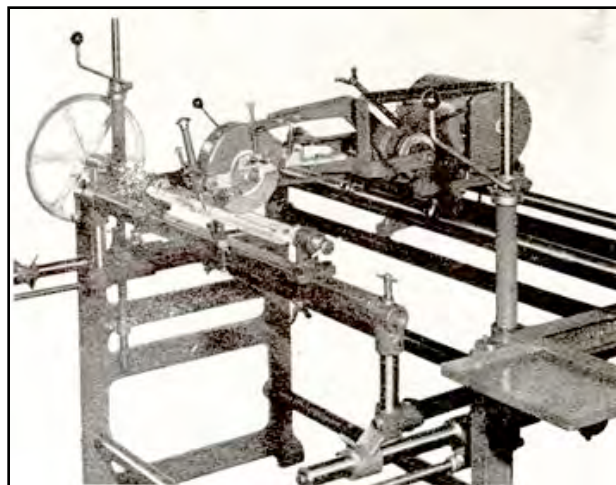


Fig. 5

8. Machine Operation. The grinding head has a carriage travel of 40" and stops are provided with rubber bumpers that can be set to limit the travel at any point. The grinding wheel is movable in a horizontal plane by using the R-243 levers at either side to move the track assembly. These are used only for quick positioning of the grinding wheel to the reel or bed knife, fine adjustments are made by moving the mower support frame with the P-429 or J-339 cranks. The grinding wheel may be positioned through a vertical arc by loosening the large wing-nut which locks the PB-122 guide arm, setting the guide arm to the position wanted, then retightening the wing nut. This positions the grinding wheel for straight line grinding only, for hook grinding the PB-122 guide arm may be left up out of the way as in the cover illustration.

## MACHINE OPERATION

9. Fundamentally the Ideal Lawnmower Sharpener consists of a frame work that supports an adjustable platform on which a lawnmower rests while the motor driven grinding wheel assembly moves from side to side on tracks grinding the reel blades to fit the bed knife; or the bed knife itself while being supported in the attachment provided; or, when desired, a reel mounted either in the supports provided or the mowing unit itself in its own bearings.

10. Most of the operating controls function to position the lawnmower with relation to the grinding wheel assembly so that the reel blades are in the proper relation to the grinding wheel as it travels across their edges while being guided by the hook which is engaged under the bed knife.

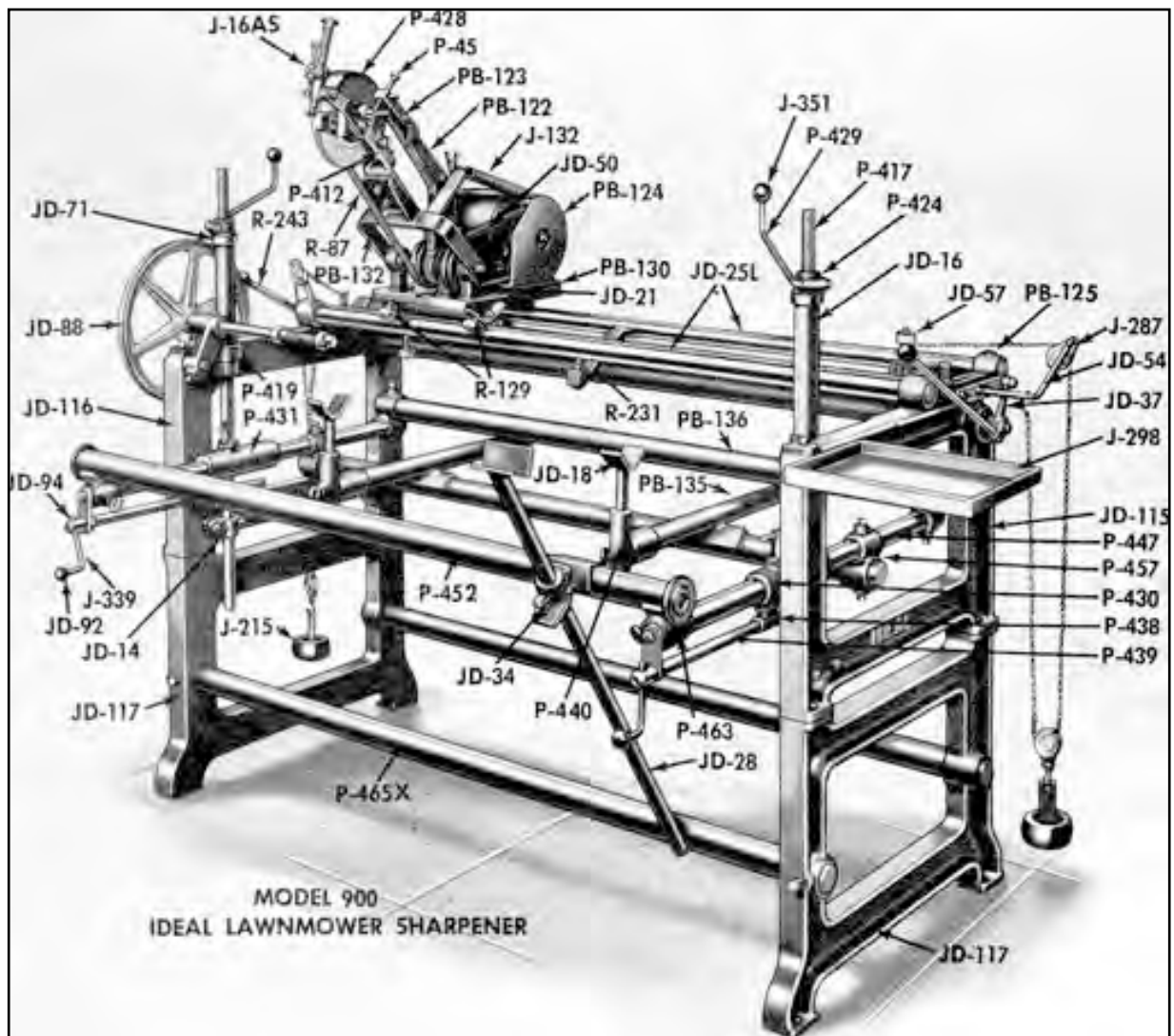


Fig. 6

11. The guide to proper positioning the lawnmower after it is placed on the adjustable platform is to its relationship to the grinding wheel is illustrated in the five figures A to E. These will be referred to as you follow the instruction covering the grinding of the reel blades.

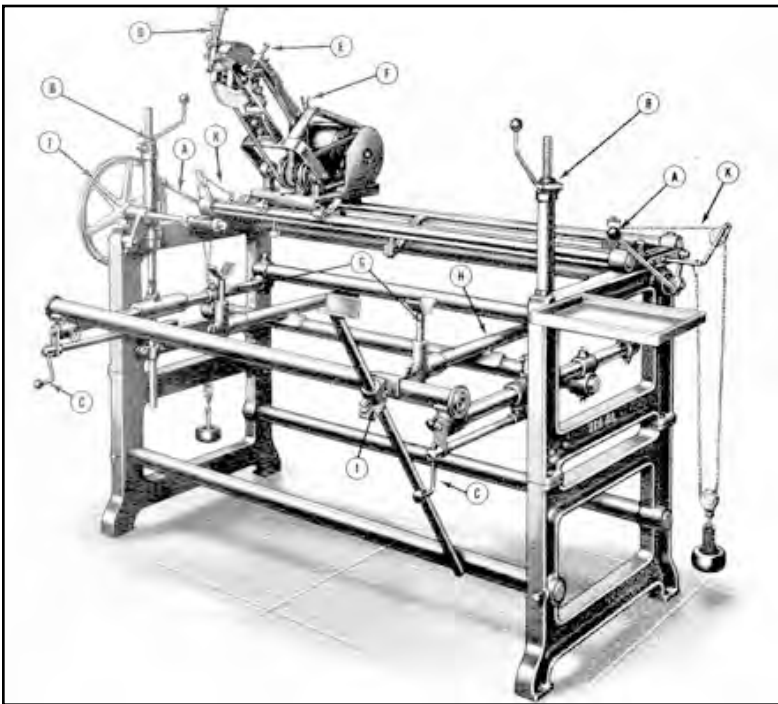
1. The Ideal Sharpener must be leveled and solid on the floor.
2. The lawn mower must (a) be resting securely on the supports provided on the adjustable platform with (b) the bed knife relationship to the grinding wheel adjusted to the proper position.

12. Mower Supports, Point and V-rests. (see fig. 7) Two mower supports of cantilever type gravity rest are free to be moved side ways on their supporting bars. They can also be turned end for end to provide a shorter support arm by reversing the P-440 castings. (see fig. 7) The P-440 castings accommodate

three sets of mower support rests. The large V-rest shown in fig 7 as well as a second set of smaller V's machined on one end, with cone points machined on the other. The cone points are used on mowers with decks covering all bars by drilling two small holes in the deck for the points of the cone supports to engage in.

13. Roller Rest Assembly. The roller rest is adjustable for height by compressing the thumb trigger. It can be placed at any position on the roller rest support pipe or can be used on the floor with the support pipe removed by reversing ends. The support pipe can be moved in or out on its side support V-rests to keep the roller rest straight up and down.

14. Carriage Adjusting Levers. (see fig. 7) The grinding head assembly which travels from side to side on its tracks is moved forward and backward by either one of the two carriage adjusting levers located at the sides of the machine.



**Fig. 7**

"A" - Carriage Positioning Levers - for rapid adjustment of grinding wheel to reel. "B" - Vertical Adjustments - both sides.

"C" - Horizontal Adjustments - both sides. "D" - Feed Screw for hook grinding.

"E" - Feed Screw for straight line grinding. "F" - Carriage Arm Lock

"G" - "V" Supports, wide, narrow "V" and point supports also provided. "H" - Mower Support Pipe - may be turned end for end if needed.

"I" - Roller Support - adjustable clamp. May be used on pipe or floor. "J" - Reconditioner

"K" - Feed Weight Chains - both sides.

15. Elevating Crank. The adjustable frame on which the lawnmower rests is moved up or down on either side (using the opposite side as a pivot) by turning either of the two elevating cranks. (No. P429, fig. 6)

16. Horizontal (forward and backward) Adjusting Cranks. The two cranks (J339) are turned to move the adjustable platform away from or towards the operator. Either crank moves its side of the adjustable platform in or out with the other side acting as a pivot.

17. Feed Control Screw. (see fig. 8) The hook, which holds the grinding unit in position with relation to the reel blades, is adjustable vertically by the feed control screw No.2. A thumb screw No.3 locks the feed control screw after it has positioned the hook or has increased the feed while grinding. The hook is removable or can be adjusted in or out to increase the range of the feed control screw. The hook is held in place by an alien set screw.

18. Finger Point Holder. By loosening the wing nut No.5, the finger point No.6 can be rotated around the grinding wheel to engage the front side of the reel blades and hold each one in a set position for the proper bevel or angle to be ground.

### **GRINDING UNIT MAINTENANCE AND ADJUSTMENTS**

19. Grinding Wheel Dresser (see fig. 9) The diamond dresser holder is mounted on the left end of the spreader bolt and is held in place by a large wing nut.

The first time this assembly is mounted on the Ideal it must be adjusted to fit. The diamond point dresser must be in line with the middle of the face of the grinding wheel and pointing toward the center of the wheel, otherwise the crown of the grinding wheel will be off center. The grinding wheel dust guard must be removed before using the dresser and holder.

### **NOTE**

The diamond dresser and holder assembly are not supplied as standard equipment with the Ideal Sharpener but are available at extra cost either individually or as a unit.

20. Finger Point and Spreader Assembly (see fig. 8) To compensate for the reduction in diameter of the grinding wheel, the finger point screws No.7 are loosened to permit the finger point No.6 to be moved closer to the wheel. The finger point should be as close as possible without touching.

21. After the finger point has been adjusted to the wheel a few times, it will become necessary to adjust the hook No.1 and hook shaft No.4 closer to the grinding wheel. This is done by loosening the spreader bolt and moving the hook shaft in until it just clears the finger.

22. Carriage Shaft Tracks. During years of service, to prevent the carriage shafts from developing flat surfaces under the carriage wheel bearings, the track shafts should be rotated periodically to provide new areas of contact.

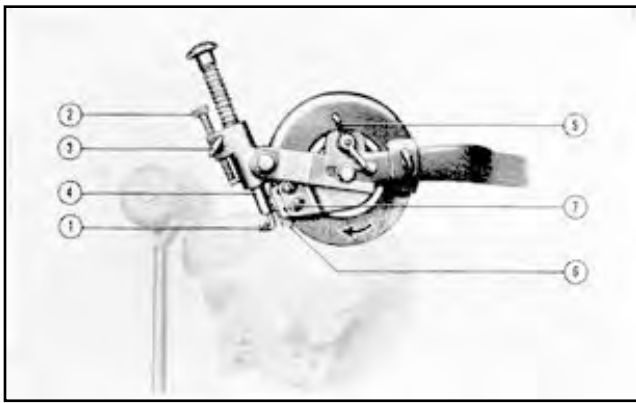


Fig. 8

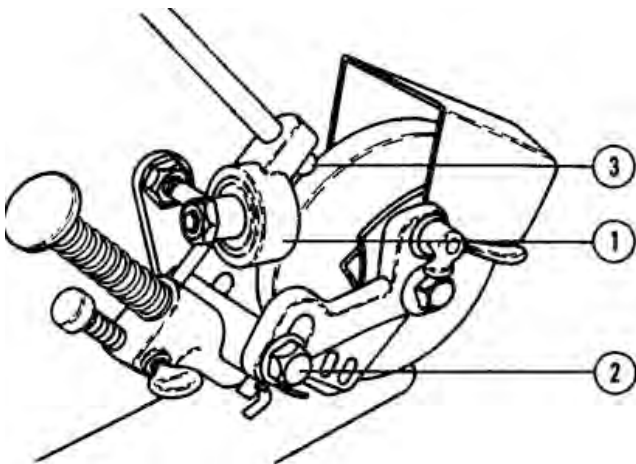


Fig. 9

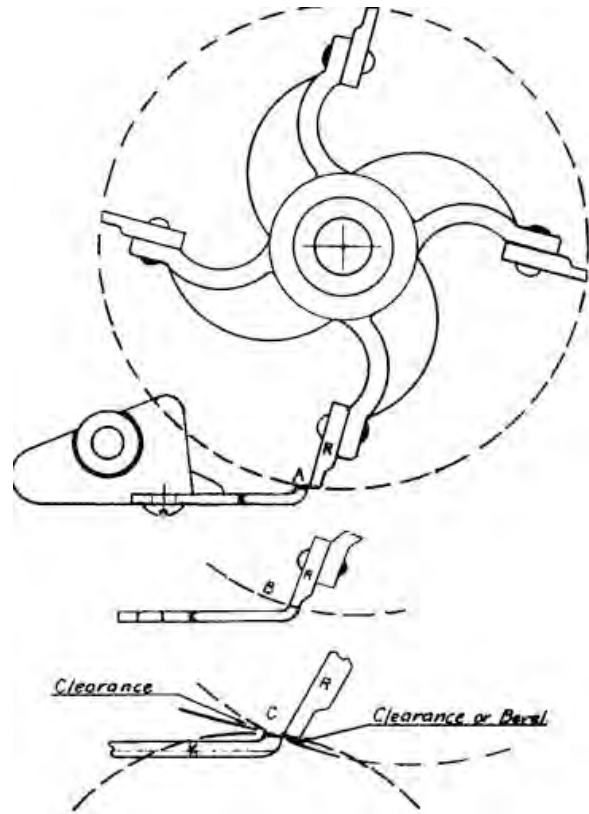
### PRINCIPLES OF SHARPENING

23. The reel type lawnmower cuts grass using the principles of shears. It is necessary, therefore, to have sharp cutting edges and these edges making close enough contact to cut the grass cleanly. This is the only method of mowing grass that is not harmful as each blade of grass is supported by the bed knife while the reel blade shears it off, thus eliminating bleeding and brown tops that are prevalent when the grass is whipped off with rotary type mowers.

24. Remember that on a five bladed reel mower, the bed knife does five times the work of any one reel blade as all the reel blades must shear against it. The bed knife, therefore, is the master cutting element and although made of heavier and harder steels, it is impossible to sharpen a mower properly with dull reel blades without sharpening the bed knife too.

25. Many mowers are successfully sharpened by grinding only the bed knife and restoring its shearing edge when the shearing edges of the reel blades are in fair condition. The reverse of this is never true due to the uneven work load imposed on the bed knife.

26. When a mower is brought to you for servicing, it is of the utmost importance to determine the cause of its faulty or unsatisfactory operation that lead to its being brought into your shop. Often times if the mower is operating satisfactory in every respect except cutting the grass cleanly, it is only in need of adjustment of the bed knife to the reel blades or this adjustment has been attempted by the operator incorrectly. Examination of the cutting edges and shearing corner on the reel blades and bed knife should determine if the mower is in need of a complete grinding job. Often times properly adjusting the mower will restore it to service or lapping the reel in with emery compound is the best sharpening method.



10

Fig.

27. If a complete grinding job is in order, the process of servicing and preparing the mower for sharpening is 75% of the entire operation. The condition check list starting with Par. 36 will be a good guide to follow for building a successful business by assuring satisfied customers.

28. The process of sharpening a lawnmower is really one of reshaping the cutting edge of the bed knife and the rotary reel blades by grinding, to restore their ability to cut grass. Equally important is the restoration of the match, or fit, of the reel blades to the cutting edge of the bed knife, against which all reel blades shear or cut.

29. For a mower to run easily and cut freely, it is important that proper bevel or relief angle be ground on both the bed knife cutting edge and the reel blades cutting edges. This gives clearance or relief behind the contacting edges and reduces drag and friction. Too little relief angle would leave more metal in contact causing the mower to run hard. Too much clearance or angle would weaken the cutting edges and they would nick easily and would not hold their adjustment.

**S. I. P. GRINDING MACHINE CO.**

Date \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Phone \_\_\_\_\_

Promised by \_\_\_\_\_

**INSTRUCTIONS**

Sharpen \_\_\_\_\_

Recondition \_\_\_\_\_

Repair \_\_\_\_\_

Labor \_\_\_\_\_

76950 Total \$ \_\_\_\_\_

76950

Handle or Motor  
Identification Stub

**CLAIM CHECK** 76950

*Thank You*

**Fig. 11**

30. For production reasons most mower manufacturers spin or cylinder grind their reels. With this method the reel is revolved on centers or on its bearings while a large grinding wheel passes back and forth grinding the reel to a true cylinder. No bevel or clearance is given to the reel blades and the entire thickness of each blade makes a rubbing contact with the bed knife. The manufacturers do put clearance or bevel on the bed knife, otherwise the mower would run too hard to sell even as new.

31. This is why a new lawn mower, especially a hand mower, can be improved by grinding the reel blades on the Ideal Sharpener. Only when the reel blades are ground one at a time can each blade be given a bevel and thus a desirable clearance behind the cutting edge. A power mower does not need as much clearance as a hand lawn mower as they need not be pushed and the cutting edges need extra strength which results by decreasing the clearance angle.

32. Because the Model 900 Ideal Lawnmower Sharpener does a precision job of grinding a lawnmower reel to fit its bed knife resulting in equal contact of all the reel blades with all points of the bed knife, it is of the utmost importance that the lawnmower be properly prepared for grinding. The preceding material has dealt with principles and theory and was not intended as specific step-by-step instructions covering specific operations.

### **CHECKING AND PREPARING LAWNMOWER FOR SHARPENING**

34. A typical customer claim check and mower identification tag is shown in fig. 11 as a guide for lawnmower repairmen and service shops that want to establish or revise an accounting system. The customer's claim stub should be left blank for his protection in case he should lose it, however, you can stamp or print your name and address on it if you wish. These tags, properly filled in and filed, provide you with a complete record and accounting system, list of customers with addresses and phone numbers, record of work done and date of last sharpening, and any other information you may wish to record. You can use this customer list to your advantage in the fall and winter by offering to pick up their mowers, provide winter storage and sharpening, and spring delivery. This will increase your off-season business and leave you free to go after new business in the spring.

35. When a lawnmower is brought to you for sharpening or winter storage, the following checks should be made, in the presence of the customer if possible, and the condition of the mower recorded.

36. Condition Check List. This provides a sound basis for charges to be made as well as a record for future reference. Notes on the condition of the mower and work customer wants done should be written on the large part of the identification tag to guide you when the mower is being serviced.

37. Handle. Check for broken welds on steel handles, or splits on wooden handles. Note if cross arm is loose. Make a note on the tag if the handle was not brought to the shop with the mower.

38. Roller. Check for split or worn (undersized) rollers and loose pins. Also check the roller hangers for excessive wear or breakage.

39. Pinions and Pawls. Turn wheels vigorously by hand to see if the reel is positively driven. If there is slippage, the customer should be advised that new pinion gears and pawls may be needed and the approximate cost of the repairs.

40. Frame. Check that the front spacer bar and the bed knife are fastened securely and that the frame in general is not loose. If the frame is loose, it is probably out of alignment. This can be checked by sighting along the front spacing bar with reference to the reel axle shaft to determine if these two are running parallel with each other. If not, the mower must be twisted by loosening one end of the spacing bar and one end of the bed knife assembly and twisting the mower frame until alignment is made. Care should be taken when retightening the spacing bar to assure the frame is not spread further apart as this will effect the reel bearing adjustment. Examine the side plates for cracks and look for stripped threads on the bed knife adjusting screws.

41. Bed Knife. Check and determine if the bed knife has enough body left to grind or if it should be replaced with a new knife blade. Also check general condition of the cast back and pivot points.

42. Reel. Check the reel for proper (free) rotation on its axis (bearing races) and examine the reel blades for bad nicks that might indicate a twisted or sprung spider. Check to see that reel blades are securely fastened to the spiders and that the spiders are secure on the reel shaft. A sprung reel blade can be forced back into place rather than resorting to excessive grinding to restore it.

43. Wheels and Tires. Check for excessive end play or wobble. Wheels may be broken or cracked and tires may need replacing due to wear. Cleaning grease and grass out of the ring gear of the wheel may make the drive more noisy but should result in easier operation. You can take your choice on cleaning the ring gear, however when new pinions are installed, the ring gears should definitely be cleaned.

44. Reel Bearings. Check for vertical or end play of the reel due to wear or improper adjustment of the reel bearings or pitted cups and cones. If the bearings are loose or worn and are of the non-adjustable type, new ones will be needed and their cost should be taken into consideration.

45. Clean and Touch Up. Most owners appreciate clean machinery and will gladly pay to have their mower thoroughly cleaned and exposed metal parts painted. (Note. The following applies only to power lawnmowers.)

46. Discuss the condition of the engine with the owner and, if necessary, start the engine and check its operation. If you do not work on engines yourself and it is in need of attention, offer to remove the engine and have the necessary work done by a garage or authorized service station for that make of engine. A working agreement should be established allowing you a percentage for work you bring in.

47. Lubrication. As the lawnmower will be turned upside down for grinding, the crank case oil should be drained. The average engine holds one pint or less of oil and you should refill with new oil. Advise your customer that your charge includes an oil change, they will be pleased with this additional service.

48. On most mowers it is not necessary to remove handles, they can be left in place during the sharpening operation. However a mower in bad condition can be worked on with more convenience if the handle is removed since it can be turned over and up on end for repairs and adjustment. Loose bearings, misalignment, sticking wheels, wire or grass tangled reel shaft, and exceptionally dirty condition are a few of the things that must be remedied before a mower can be ground. You can decide if these conditions can be most conveniently remedied with the handle on or off. As far as the operation of the Ideal is concerned, it makes no difference. 49. The same is true for power mowers. They can be sharpened in your Ideal Sharpener while completely assembled, engine, handle and all. However if there is any amount of repair work necessary, it will be more convenient to disassemble them. Power mowers generally are driven by chains which drive the reel axle, this in turn drives the wheels through the pinion gears which are reversed as compared to a hand mower. Best results are obtained by having the drive chain disconnected as the reel must be free to turn. Some mowers have this chain encased making it difficult to remove. If the driving clutch is such that the reel will revolve fairly free, the drag from the drive chain may not be sufficient to interfere with the sharpening operation.

## **REMOVING AND GRINDING THE BED KNIFE**

50. It is impossible to cover the exact steps and procedure necessary to sharpen every different make and model of hand and power lawnmowers. You will have to use your own ability, and sometimes ingenu-



ity, in following our general instructions and applying them to many different types of mowers.

51. The first step in the sharpening procedure is to remove the bed knife (sometimes called the straight blade, cutter bar, stationary blade and other names, we shall refer to it as the bed knife) from the mower. Most bed knives are held in the mowers by cap screws or nuts and bolts through the ends of the bed knife cast-back and the side frames of the mowers. Relieve the pressure or tension on the bed knife adjusting screws before removing the end bolts. Put a few drops of oil on all screws or bolts removed or loosened, this will help in re-assembling and adjusting and will prevent rust. This practice will also make mowers easier to work on when brought to you for future sharpening jobs. After the cap screws or bolts are removed, use a large screwdriver or pinch bar to spring the side frames of the mower apart so that the bed knife can be removed (see fig 12). Some mowers are constructed differently and the above procedure would not fully apply. However after you have worked on a few mowers, you will be able to remove any bed knife, no matter how it is constructed, in a very short time.

52. After the bed knife assembly is removed it should be cleaned and inspected. A screwdriver or putty knife and wire brush will effectively remove the dirt and grass that accumulates behind the lip of the bed knife. The blade must be clean before it is ground.

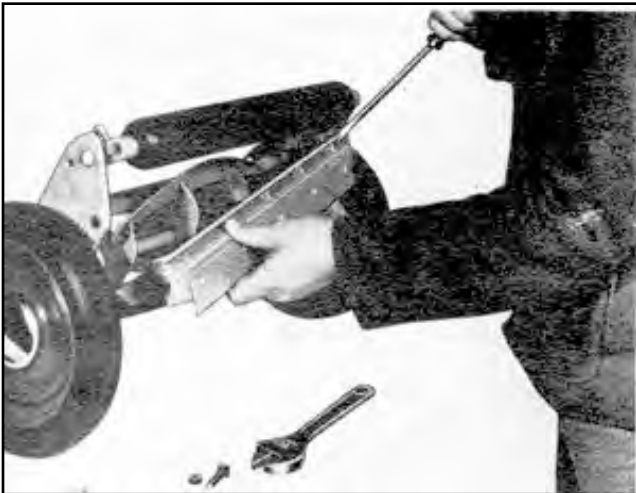


Fig. 12

53. It should be noted if there is a wavy appearance or condition along the top face of the bed knife. This would indicate that the bed knife has been adjusted to the reel with excessive pressure and, very likely, a condition of loose reel bearings. Also the contacting area of the top face edge made by the reel blades should be noted. If the mower is quite dull, this area

will probably cover the entire thickness of the lip. Improper adjustment may result in having more lip left at one end of the bed knife than at the other end. It is advisable to compensate for this by removing more metal at the thick end bringing the bed knife back to an even thickness after sharpening. The roundness of the front cutting edge should be noted as an equal amount from both the front edge and top face will have to be ground away to arrive at a sharp, shearing corner. If the edge is extremely rounded and dull, it is advisable to remove a little more metal from the front edge.

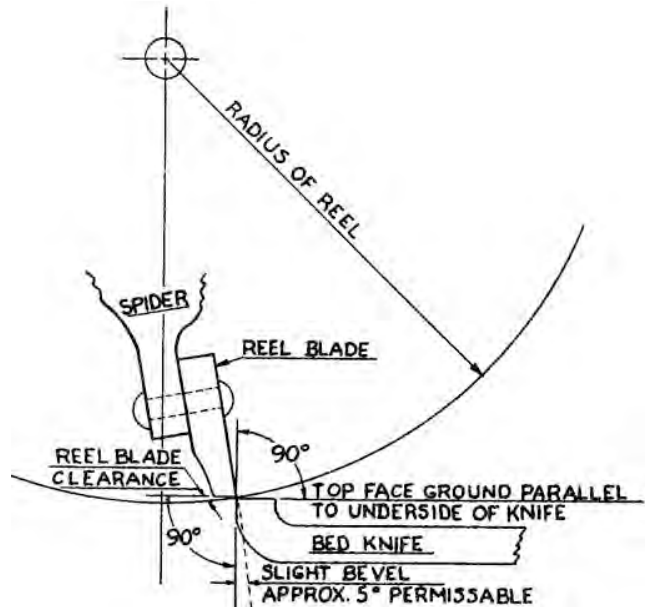


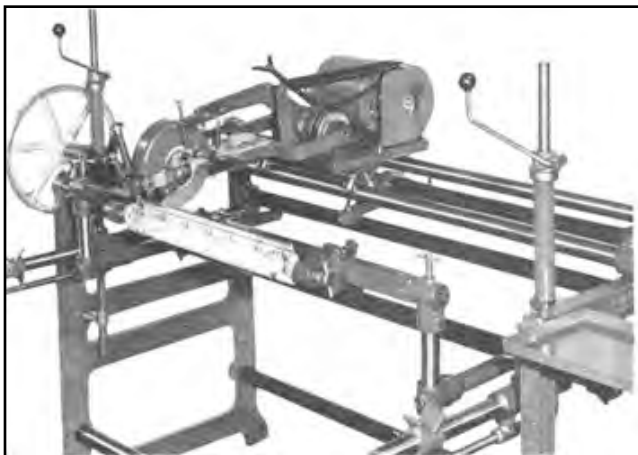
Fig. 13

54. Fig. 13 illustrates the angles and relationship of a bed knife to the ground and to the diameter of the reel blades. There are exceptions to this illustration but this is the more general type that will be found. In all cases the front edge of the bed knife should be ground first. The wire edge left from this grind will be removed when the top face of the bed knife is ground. The front edge can be ground perfectly square, however, as the illustration in fig. 13 shows, an angle of 5 to 10 degrees is desirable. After the front edge has been ground, the top face is ready to be ground and, referring again to fig. 13 a perfectly level surface will provide clearance. When grinding this surface, the first light cut should show contact with the back edge of the lip indicating clearance behind the front shearing edge when the blade is ground down to provide a new sharp front edge.

55. To use the bed knife grinding attachment supplied with your Model 900 Ideal it is necessary to remove the two P-440 V-rest support castings from the PB-135 mower support arms (see fig 14.) and in their

place install the two P-436 knuckle castings that fit the PB-135 arms. The P-436 knuckles hold the bed knife attachment support shafts onto which the second set of P-436 knuckles fit over (see fig. 14). The bed knife support bar is now in place and free to rotate when the T-handled locking screws are loosened in the P-436 support knuckles. The bed knife support bar is fitted with adjustable centers to accommodate bed knives. Both centers are adjustable for spacing on the support bar, however only one is equipped with a live center for tightening the bed knife in place. In the center of the support bar there is provided two adjusting screws which can be set against the bottom surface of the bed knife to prevent it from rotating and to secure it for grinding. (see fig. 15)

56. If the particular bed knife you are to grind does not have holes in the ends to accommodate these centers, we recommend that you counter-drill a small V4" hole approximately 3/8" deep to provide a method of holding the bed knife assembly with the centers. With the bed knife securely in place, the entire bed knife assembly can be rotated by loosening the two T-handled screws on either end of the bed knife attachment, so that the front edge of the bed knife is brought up on the proper position, giving an angle of 5 to 10 degrees as shown in fig. 13.



**Fig. 14**

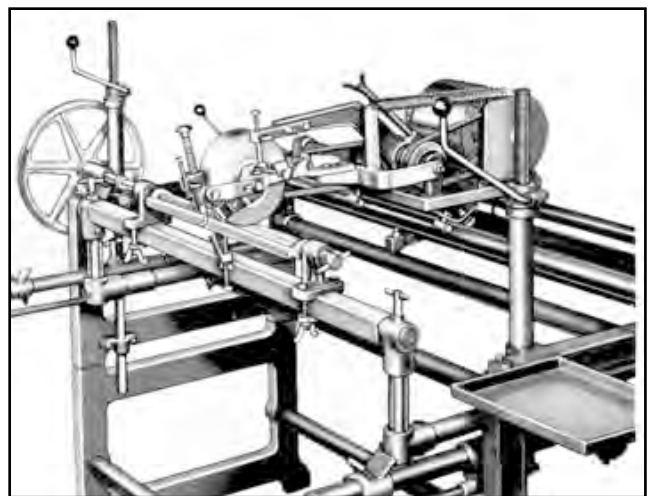
57. The grinding head of the Ideal must be set up for straight line grinding by connecting the small J-345 spring on the goose neck supporting arm to the anchor pin provided on the grinding wheel fork as shown in fig. 14. The grinding head assembly is now lowered into position by loosening the wing nut and lowering the assembly and then tightening the wing nut clamp to hold the support goose neck in position (see fig 14). The feed control screw which controls the straight line grinding feed should be screwed down until some pressure is felt. In most

instances we recommend half way, or half the length of the feed control screw. (see fig. 14),

58. Check the alignment of the bed knife by moving the grinding carriage (motor off) to one end of the bed knife and rotating the J-28C finger point down until it is just touching the top face of the bed knife. Now move the carriage to the opposite end of the bed knife and determine if the finger point, which was locked into position, is contacting this end the same as it was at the other end. If not, the horizontal, or in and out adjustment of your machine can be used and the bed knife squared until it is aligned with the travel of the grinding wheel. Once this is accomplished the J-28C finger point can be rotated back out of the way and need not be left in contact.

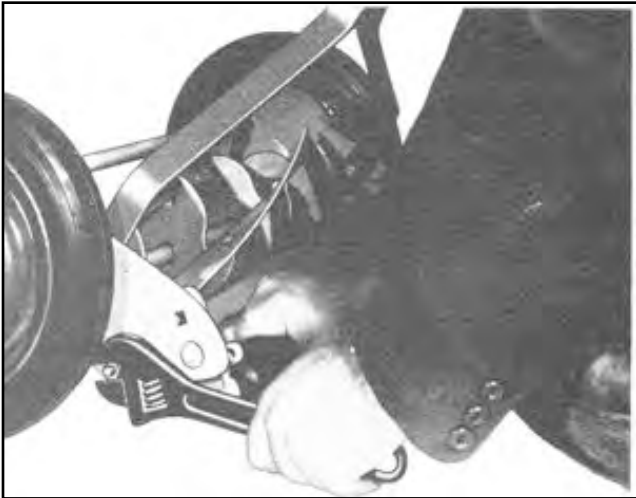
59. Again move the grinding carriage to one end of the bed knife and, with the feed control screw, adjust the grinding wheel until it is just contacting the bed knife, with the grinding wheel scratching lightly. Now move the grinding carriage to the other end of the bed knife and determine if the grinding wheel contacts this end in a like manner. If it does not, it will be necessary to use the vertical adjustment on this side of your machine, positioning the bed knife up or down until the grinding wheel is contacted in a like manner. Again, if much adjustment is needed we suggest you return the carriage to the opposite end and repeat these directions until the grinding wheel is scratching the bed knife at each end equally. You now have the bed knife positioned properly and it is in line with the travel of the grinding wheel.

60. Before starting to grind, be sure your eyes are protected by goggles or a grinding mask of some type. This is a safety precaution that should be followed before doing any kind of grinding.



**Fig. 15**

61. Start the motor and grind the front edge by moving the carriage back and forth. Feed can be increased if needed by turning the feed screw (E fig. 7), continue grinding until front edge is true and even and a new sharp shearing edge is produced the entire length of the bed knife. With the front edge completed, you are ready to rotate the bed knife into position for grinding the top face surface. (see fig. 15)



**Fig. 16**

62. We suggest that the bed knife be rotated to the position shown by loosening the T-handle locking screws at either side of the bed knife grinding attachment. By using a position as illustrated in fig. 15, bed knives with projecting ears will not interfere with the grinding head traveling to the extreme ends of the bed knife. When the bed knife is rotated to this position, the bed knife attachment will usually have to be moved closer to the carriage rails of the grinding head. Use the quick in and out adjustment of the grinding carriage assembly on either side of the machine and then check the alignment of the bed knife by using the telescoping gauge provided with your machine. This gauge provides a means of measuring the distance from the front edge of the bed knife to the front carriage track shaft at either end of the bed knife and squaring the bed knife with the horizontal adjustment until this distance is equal. This was the same step accomplished in grinding the front edge by using the J-28C finger as an indicator to the bed knife alignment. However in its present position the finger can not be used for this operation. The grinding head should be brought down and the bed knife so positioned that when the grinding wheel scratches, it is contacting behind the cutting edge thus assuring the desired clearance. By turning the motor by hand and having the grinding wheel scratch, the contact can be noted and the exact angle, and the amount of metal to be removed behind the cutting edge, determined. After the bed knife has been positioned to give the

desired results, again the grinding wheel is set to scratch lightly at both ends of the bed knife by using the vertical adjustment cranks located at each side of the machine. When equal contact is being made, start the motor and resume grinding the bed knife, increasing the feed until you have ground down to a new edge the entire length of the bed knife. When a new edge has been reached, remove the bed knife from the holding bar. When grinding gang mowers or more than one of the same make and model of mower, we suggest that all bed knives be ground before removing the bed knife grinding attachment from the Ideal. This will eliminate setting up time on each individual bed knife.

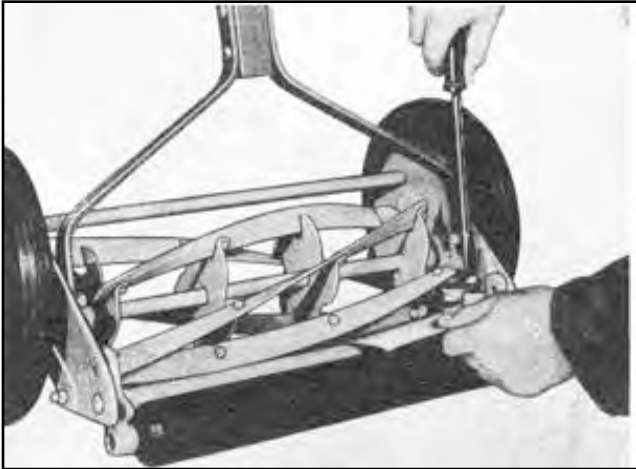
63. After the bed knife has been removed from the machine we suggest that a small honing stone or a fine mill file be used to slightly hone or touch up the new cutting edge and remove any slight burr or wire edge that might have remained. If the bed knife and the mower are not to be used immediately, apply oil to the ground surfaces to prevent them from rusting. This will further serve to lubricate the sliding of the hook if the hook grinding principle is to be used in grinding the reel blades.

64. Some shops and service men have added the Model 50 Ideal Bed Knife Grinder in their first year of business, some in their second year. Men who are experienced in the lawnmower service field usually order the Model 900 Ideal..and the Model 50 Bed Knife Grinder together. The Model 50 eliminates the need for the bed knife grinding attachment on the Model 900 Ideal. However many men have continued to use the attachment where a limited number of mowers are to be ground each year. The Model 50 is a commercial shop machine designed especially for the grinding of bed knives and if the amount of your work would warrant it, it would speed up your production and increase the number of men you could use to service lawn mowers in your shop.

### **REPLACING THE BED KNIFE AND PREPARATION FOR REEL GRINDING**

65. We will now proceed with the replacing of the bed knife and the necessary instructions for preparing the mower for reel grinding as would be necessary with the hook grinding principle. In the event that you do not intend to do hook grinding it would be well to read the instructions anyway, and then proceed further on in the book to the instructions for straight line grinding the reel, either in or out of the mowing unit. We suggest that you try the hook grinding principle as it will prove very successful on your smaller mowers, particularly hand and home type power mower units. Many owners of the Ideal grinder prefer to use the

hook grinding exclusively while still others prefer the straight line grinding principle. This of course will be up to the individual, however we feel that you should give the hook grinding principle a try to better understand the problems and principles in grinding lawnmowers.



**Fig. 17**

66. The bed knife is replaced in the same manner in which it was removed, using your screwdriver or small pinch bar to spread the frame of the mower. Install the end bolts that hold the bed knife in the mower frame but do not tighten them too much, just snug them up as the bed knife must be pivoted around these bolts and final tightening should be done after the final and permanent adjustment has been made on completion of sharpening. See fig. 16.

67. After the bed knife has been replaced in the frame of the mower, the mower should be checked as outlined previously in the section entitled "Checking and Preparing Lawnmower for Sharpening" and at this particular time paragraphs 40, 41, 42 and 44 should be followed closely as there are many types of reel bearings used in lawnmowers and most of them are provided with some means of adjustment. Some types are not adjustable and if they are loose, they will have to be replaced with new bearings. Most hand mowers have ball bearings of the adjustable cone type. To take up or adjust these bearings, provision is made to screw the cone into the ball cup or vice versa. Sometimes the cone is threaded on the reel shaft or in the side frame or the ball cup is threaded in the side plate. Other types use a split bearing cone with two pointed set screws opposite each other. To tighten this bearing, loosen one set screw and tighten the other. This causes the split bearing to spread and tighten. Another type is the spring loaded bearing where the spring keeps constant pressure on the cone pushing it into the ball cup. There is no take up adjustment on a spring

loaded bearing and replacement need be made only when the spring weakens or breaks or the parts simply wear out. Another type is the roller or needle bearing variety which also has no take up or adjustment except where tapered roller bearing are used. If adjustment cannot be made on loose reel bearings, the bearings must be replaced. Remember that it is impossible to do a satisfactory job on a mower if the reel bearings are not in proper adjustment. Any looseness in the reel bearings would have the same result on the grinding of C' reel as a loose bearing or center in a lathe would have. It would be impossible to turn anything round and true in a lathe with one end or the other loose and the same is true in grinding the reel of a lawnmower, it cannot be ground true if the bearings have any play. We could go on indefinitely on the subject of bearings and we still could not tell you as much as you would learn by working on a few mowers. The important thing is that the bearing must not be loose when you grind a lawnmower Also in taking up the bearings, do not get them too tight as the reel must turn freely.

68. Power mowers today, with a few exceptions, use tapered Timken Roller Bearings on the reel shafts. These bearings seldom need adjustment and when they do, it is very easy to do and would be similar to adjusting the front wheel bearings on your automobile. You simply tighten the nut which holds the tapered bearing and cone in place to take up looseness. The tighter the nut is turned, the tighter the bearing fits and care must be taken not to get it too tight.

69. The bed knife must now be adjusted to the reel blades in preparation for grinding the reel blades. It must not touch the reel blades as the reel must be free to turn while grinding, yet it should be set as closely as possible to the reel blades. We recommend that a double thickness of paper or a calling card be used to make this adjustment. Insert the card or paper between the bed knife and the highest reel blade (if anyone blade extends out further than the rest) and tighten the adjusting screws until this blade just pinches the paper at both ends of the bed knife. See fig 17. It is essential that you have the adjusting screws at this point set just as tight as you want to set them later for grass cutting. The reason for this, and the secret of our hook grinding principle, is that practically all bed knives distort or spring, under the pressure of the adjusting screws and if this distortion is not the same when the reel is being ground as it will be when the mower is cutting grass, there may not be perfect cutting contact between each reel blade and every point of the bed knife. This distortion usually causes the bed knife to bow out in the center and increased pressure would cause it to bow out further,

therefore with cutting contact at either edge of the bed knife there would not be cutting contact at the center.

70. By hook grinding it is possible to grind the reel blades to fit the contour of the bed knife under the pressure of the adjusting screws and you can appreciate the importance of maintaining the same pressure on the adjusting screws during grinding and grass cutting. If the bed knife remains straight when clamped in the mower, so much the better arc the reel blades will be ground straight to fit it. But if, like many, the bed knife distorts from a straight line, the reel blades will still be ground to fit it. Tighten the adjusting screws with the bed knife pinching the paper on the highest reel blade and keep the same screwdriver or wrench at hand for making final adjustments after grinding the reel.

71. If, for any reason, you have to remove the engine from the power mower, try to keep the handle and engine together and don't disconnect the throttle control wire unless absolutely necessary. Wherever possible disassemble by removing the deck-plate, engine, handle, and controls all in one unit and you will have saved a lot of time and trouble in reassembling the mower. If there is no reason to disassemble a power mower then the following steps must be taken before reel grinding: (1) Drain the oil from the crank case. (2) Remove the oil bath air cleaner. (3) Remove or drain the gasoline tank. We recommend complete removal of the gas tank when possible as even a drained tank can be dangerous with grinding sparks flying. (4) Disconnect the chain which drives the reel. Sometimes this chain is covered and you cannot get at it without a lot of dismantling. If this is the case, then leave the chain connected and disconnect the chain or belt from the jack shaft to the engine. The Reo Royal is one power mower on which it is not practical to disconnect the chain drive. The important thing is for the reel to turn freely during grinding and if the jack shaft turns without too much drag, then the chain need not be disconnected. On heavy-duty Park and estate type mowers that have a separate clutch to control the reel, it is usually only necessary to have this clutch disengaged. (5) Any Obstruction that would prevent the grinding head and hook from traveling to the extreme ends of the reel blades must be removed. On the Jacobson Lawn Queen, for example, are two reel guards held with screws, these must be removed. On the Reo Royal it is necessary to remove the right wheel and wheel plate, but on most mowers there is nothing to interfere with the hook. (6) The deck-plate on most power mowers covers the shrub bar completely leaving no bar or shaft exposed on which to support the mower with the standard "V" rests. It may be necessary to drill two holes 3/16" or V4" in the deck-plate to provide firm support using the

pointed end of the small "V" rests. These holes should be located nearly in line with the shrub bar and near the side frames of the mower. (7) Before placing the mower in the machine, measure the spacing of these holes and set the pointed mower supports at the same width. This will eliminate having to adjust the mower supports while placing the mower in the machine.

### **GRINDING REEL BLADES, WITH HOOK PRINCIPLE**

72. Before placing the first mower in your Ideal, set both the vertical and the horizontal adjusting screws at their mid-point or halfway positions. This will provide an equal range of adjustment in both directions.

73. Choose the most suitable pair of mower supports for the mower to be sharpened and place them in position in the Ideal. If the cone pointed supports are used, pre space them by measuring the hole spacing on the mower. Place the mower in the Ideal inverted as shown in the various illustrations. Place the roller support assembly under the roller and adjust the roller rest supporting pipe in or out until the roller support is about vertical. The roller rest supporting pipe is adjusted by moving the supporting castings at either side of the machine. For some types of power mowers, it is desirable to use the roller support on the floor, leaving off the roller support pipe as shown on the cover.

74. Raise or lower the roller support (vertical) pipe by compressing the thumb trigger so that the mower is level, (as though it were in mowing position set up side down.) This should make the bottom of the bed knife blade about level. Move the mower supports out against each side frame to eliminate any possibility of side movement of the mower (unless point supports are used).

75. The feed control screw which controls feed of the grinding wheel by permitting the hook shaft to slide through the J-16 casting (see figure A) should be turned in or out until an equal portion of its length is extending through the J-16 casting on either side as shown in figure A and B. This will allow ample spread length for feeding the grinding wheel while setting up and sharpening. The finger point, P-256C, which controls the bevel, should be rotated as far around the grinding wheel toward you as possible, shown in figures A and B.

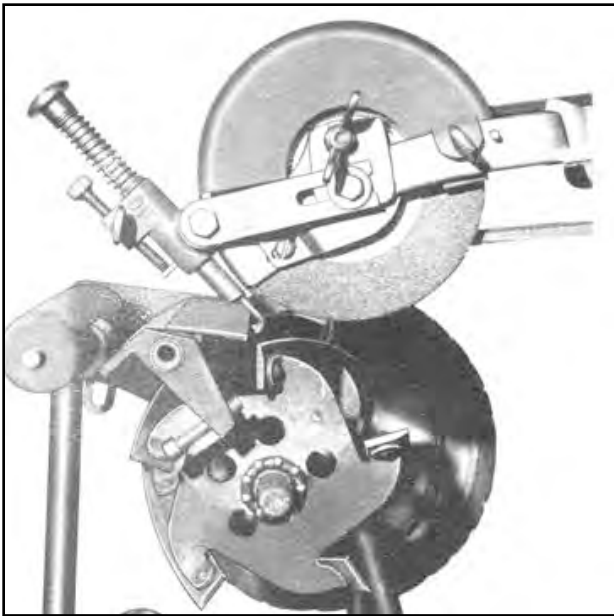


Fig. A

Note clearance between reel blade and grinding wheel. Lawnmower is too low while roller is slightly high. To correct, entire mower should be raised with the vertical adjustment cranks (8, Fig. 7) and the roller should be lowered until bottom surface of bed knife is level.

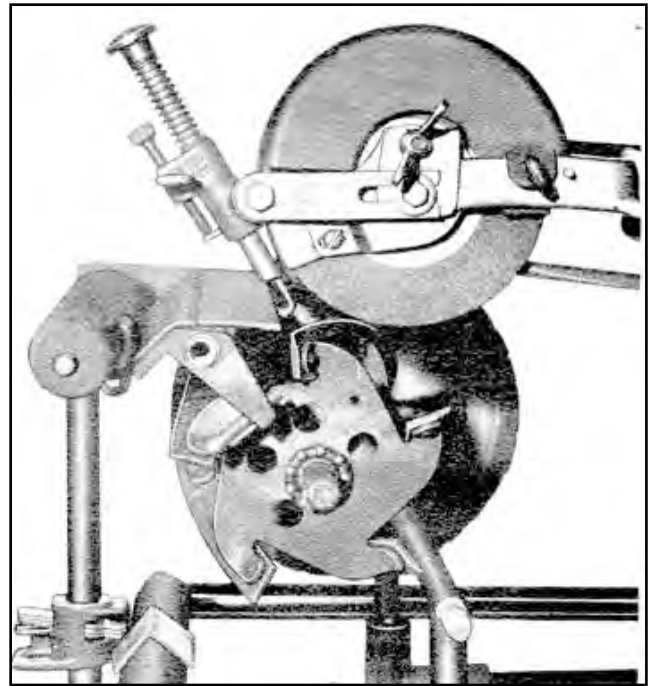


Fig. C

Mower is shown here in proper position after being corrected from the positions of Figures A and B. Note that the mower has been moved until there is approximately 1/8 to 1/4 of an inch clearance between the reel blade and the grinding wheel. The roller has been adjusted so that the bottom surface of the bed knife is level. The mower has been positioned horizontally and the grinding wheel carriage positioned (Adjustments A and C, Fig. 7) so that the guide hook is extended under the front edge of the bed knife approximately 1/8 of an inch. In this position, the grinding wheel is well within the range of the reel blade using the feed control screw (D, Fig. 7) which has been set at the halfway point throughout Figures A, B and C.

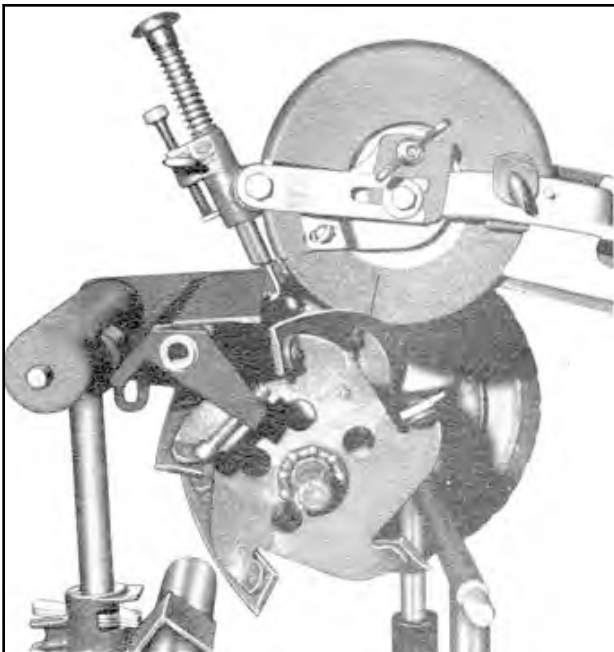


Fig. B

Note relationship between grinding wheel and reel blade. Lawnmower is too high and roller is too low. To correct, entire mower should be lowered with the vertical adjusting cranks (B, Fig. 7) and the roller raised until bottom surface of the bed knife is level.

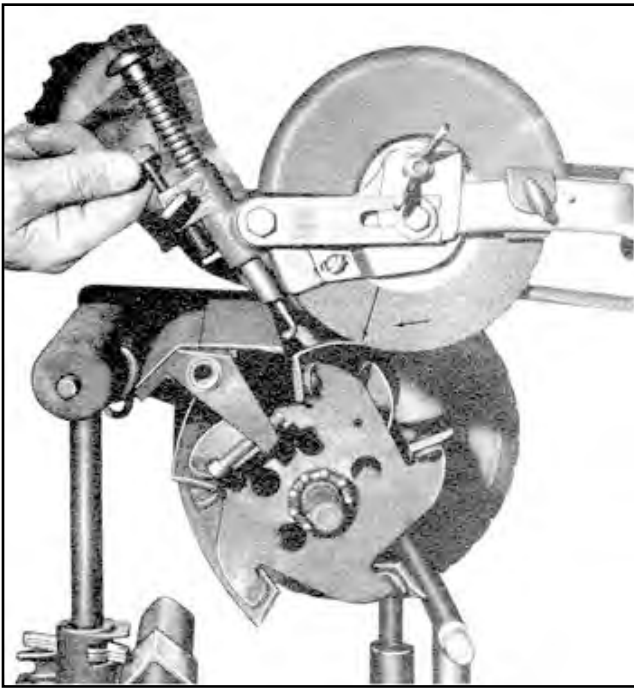


Fig. D

Using the feed control screw as shown, lower the grinding wheel until the reel blade, when rotated under the wheel, just makes contact at the point indicated. This is the "no clearance" point and if the bevel control finger (6, Fig. 8) were set to the reel blade at this point, the blades would be ground without bevel or clearance behind the cutting edge.

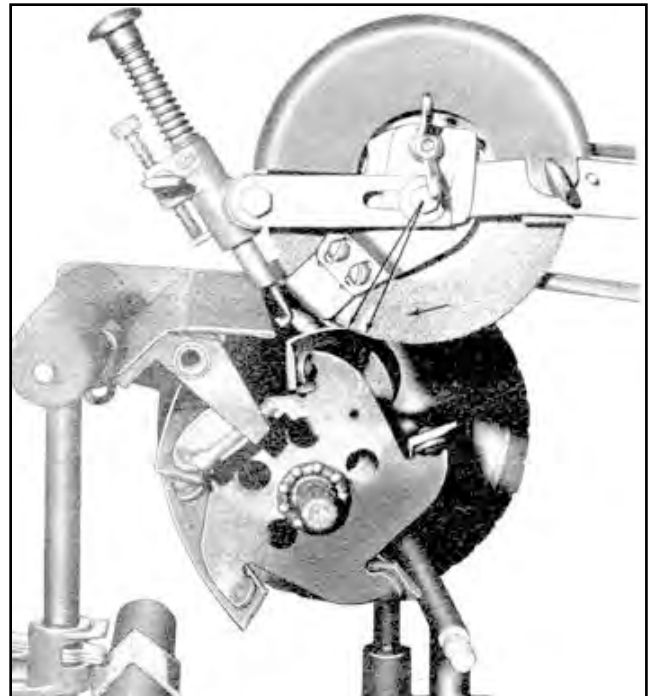


Fig. E

This is the mower ready to grind. Two arrows indicate the points on the grinding wheel where the contact was made in Fig. D and the "no clearance" point was determined. The other arrow shows the amount the grinding wheel has been lowered by turning the feed screw (D, Fig. 7) approximately 112 turn outward. Then, when the reel blade was moved back against the grinding wheel, it made contact ahead of the point it had originally touched. With the grinding thus lowered, the reel blade would not pass. At the point where contact was made, the bevel control finger point (6, Fig. 8) was moved to and set against the reel blade. This established the proper bevel which will be ground on each reel blade. These steps covered in Figures A to E illustrate the major procedures for using the hook grinding control feature. Each can be accomplished in the center of the mower. Between Figures C and D, the mower should be leveled crosswise using the vertical adjusting cranks (B, Fig. 7) and maintaining the 118 to 1/4 inch clearance as shown in Fig. C. After Fig. E, the mower must be aligned horizontally by moving the grinding head from end to end of the bed knife with the grinding wheel in contact with a reel blade. Adjust the horizontal adjusting cranks (C, Fig. 7) until the grinding wheel scratches the same reel blade with equal pressure at each end. With this final adjustment made, you would be ready to proceed with grinding as described further on these pages.

76. If you have a small bubble level available, it can be used to advantage by laying it on the bottom of the bed knife along its length and, with the vertical side adjusting cranks, adjusting the mower until it is level. Thus it will be aligned horizontally with the main carriage tracks or shafts of the machine. If a level is not available, you may sight through the lawn mower and get the reel shaft parallel with one of the main shafts of the machine, preferably the front carriage shaft, close enough by eye sight. We caution you against using the roller of the mower to sight over as this is often times set crooked and not parallel with the reel shaft.

77. As a guide to properly position any lawnmower to be ground in your Ideal, which is your next step, we refer you to figures A, Band C. Lower the grinding head and with the quick in and out adjusting levers, position the grinding head in the center of the mower with the hook engaged under the front edge of the bed knife approximately  $V_4$ ". If there is more than  $V_4$ " clearance between the reel blade that can be rotated under the grinding wheel as shown in figure A, be guided by the caption under this figure. 78. With the hook disengaged from under the front edge of the bed knife, lower the grinding head until the hook is in contact with the now top side of

78. With the hook disengaged from under the front edge of the bed knife, lower the grinding head until the hook is in contact with the now top side of the bed knife, which is the bottom side, and move the grinding head from one end to other permitting the hook to scribe a line showing whether it is running parallel with the front edge approximately  $V_4$ " back. If the mower is not square with this line, the side horizontal adjustments can be used. Another method of squaring the mower is accomplished by using the quick in and out adjustment levers of the carriage tracks. Set grinding head so the hook just touches the front edge of the bed knife at one end when the grinding head is moved up and down vertically. Now move to the opposite end and, with the horizontal adjustment on this side, move the mower in or out until the hook is making like contact at that point. Recheck this adjustment by moving back to the starting end and adjust first the grinding head and then the mower until the mower is squared with the hook approximately equal at both ends. Now return to the center of the mower and move the grinding head toward you until the hook is engaged under the front edge of the bed knife approximately  $1/8$ ".

79. If, after the hook is engaged, the nearest reel blade can not be rotated under the grinding wheel due to insufficient clearance as shown in figure B, be guided by the caption under this figure. After following

the instructions in the above mentioned captions the mower should be positioned as shown in figure C (note caption). If care has been taken when the mower has been raised or lowered to have turned both cranks an equal number of turns, it should still be level. However it would be well to check the mower for levelness as previously described.

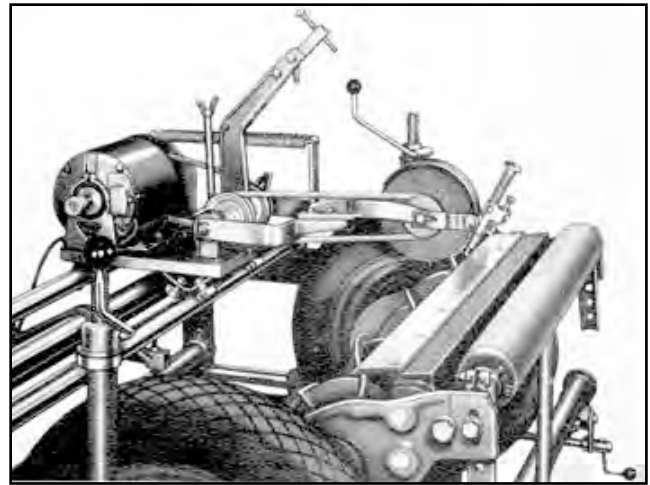
80. Turn out the feed control screw which will lower the grinding wheel until the nearest reel blade when rotated back and forth under the grinding wheel just makes contact lightly with the grinding wheel as shown in figure D and is referred to as the "no clearance or no bevel point". This point is where the diameter of the grinding wheel and the diameter of the reel make contact, see caption figure D. Now rotate this reel blade toward you until it is out from under the grinding wheel and observing the mark on the feed screw, unscrew an additional  $1/3$  turn for power mowers and up to  $1/2$  turn for hand mowers. This will cause the grinding wheel to lower further and thus the diameter of the grinding wheel and the diameter of the reel can no longer pass or make light contact, so when the reel blade is rotated forward it should strike the grinding wheel at a point where the proper amount of bevel would be ground. These two contact points are illustrated in figure E and the P-256C should be moved down and locked in position thus holding the blade in contact at this point on the grinding wheel. With this method it is possible for you to set the same amount of bevel angle on any mower by the amount you turn the feed control screw after the determining of the "no clearance" point of the wheel and reel. This is the only method we know of where the exact bevel angle can be duplicated again and again on any mower and it can be altered to suit the individual. (Note caption, figure E)

81. You may now rotate the grinding wheel by hand, using the reconitioner pulley on the left side of the motor as the hand wheel. Turn the grinding wheel in the direction indicated by the arrow on the wheel shown in figure E. This should scratch the reel blade lightly and make possible a visual check as to the bevel to be ground. The grinding wheel should mark the reel blade behind the cutting edge indicating bevel, and clearance be hind the cutting edge when you have ground the blades down to a new cutting edge. If the grinding wheel is not scratching with sufficient pressure to make this mark evident, a slight amount of downward pressure can be applied by hand on the grinding head. Now you have but one remaining step to complete your set-up before grinding the reel blades. Move the grinding head to the left side of the mower and, on the same blade that you have been using to set your bevel, position the grinding wheel on this blade in from the left hand side at a



station directly over the first reel blade supporting spider. With the hook engaged under the bed knife and the reel blade positioned against the bevel control finger rotate the grinding wheel again by hand to determine if it is lightly scratching the reel blade at this station. If it is not, move the mower in or out using the left horizontal crank until a light scratching contact is made. Now move the grinding head to a similar position at the right side of the mower and on the same reel blade repeat the above procedure. If an adjustment is needed then recheck again at the same station on the left hand side. Repeat these checks until the wheel scratches equally at both sides without further adjustment, because if one side of the mower must be moved to any degree, it will cause the other side to change slightly also. Through these steps do not change the feed control screw or the position of the bevel control finger. Make all adjustments with the horizontal adjusting cranks, do not use the vertical adjusting cranks. In checking the wheel contact, the same reel blade should be used and the check should be made about the same distance in from the end of the reel blade at each end.

82. Set the carriage stop so that the hook has room to disengage at one end of the bed knife and re-enter at the other end. These stops will prevent the carriage from traveling too far and possibly grinding into the side frames of the mower. Now number the reel blades with chalk using the blade on which the adjustments were made as No.1. Roman numerals serve best and you should rotate the reel blades toward you numbering them in that order at the starting end. The mower shown in figure E has a five-bladed reel with a left-hand twist. This is the most common type and the proper direction of grinding wheel travel is from left to right. The left-hand twist mower when standing behind it in mowing position wind rows the cut grass to the operators left. A rule to be governed by as to the grinding direction is indicated by the twist or spiral of the reel blade and these blades will always point toward the starting end. Thus when grinding is commenced at this end, the reel is rotated by the grinding wheel and the reel blade held against and stopped by the bevel control finger. It is not recommended that the reverse grinding direction be used as this makes it necessary for the finger point to cause the rotation of the reel and effects the grinding action and accuracy. The weight feed can be connected for the proper grinding direction and you are ready to grind your first mower. We would suggest that you add at least one extra weight to the feed weight and later on you may wish to use both for taking heavier cuts. The weight feed works better with a little oil applied to the surface of the hook and to the under side of the bed knife blade where the hook must slide.



**Fig. 18**

83. Before you begin to grind, we suggest you practice engaging the reel blades with the grinding wheel a few times before starting the motor. The blade should be started just behind the point of the finger allowing the taper of the finger to guide the blade down to the contact point with the grinding wheel. Use the right hand to guide the reel at the extreme end of the reel blades below the cutting edge, then if the grinding wheel should accidentally kick the reel around, you will not be cut. With the hook disengaged, start the motor. The grinding wheel should grind blade No.1 lightly and the feed screw should be left just as it is for the first pass over each blade as some may be higher than others. Starting with reel blade No.1, grind each one in rotation, 1, 2, 3 and so on, until you are around to blade No.1 again. The feed can be increased on blade No.1 before starting the next round but it should only be increased on blade No.1, the feed screw should not be moved on any intermediate blades. To increase the feed, the feed control screw is turned counter clockwise approximately  $\frac{1}{4}$  of a turn. Always lock the feed control screw with the thumb screw after changing the feed. During the first or second time around the blades, check to see if the grinding wheel is cutting heavier on one end of the reel than on the other, not on one single blade but on all of them. If this occurs, further adjustment is needed and the side that is light should be moved in closer with the horizontal adjusting crank. Continue grinding in rotation and notice if there are any high or low spots. The grinding wheel will speed up across a low spot and slow down to grind a high spot. You will soon be able to detect by the sound of the grinding wheel and the travel of the carriage when all blades are ground evenly. Stop when you come to blade No.1 and inspect the blades to see if you have reached a new cutting edge. It may be necessary to increase the feed again and repeat the rotation as many times as are needed to true up all

the blades and bring each one of them to a sharp, new cutting edge. While the grinding wheel is grinding on a reel blade care should be taken if the grinding head is helped by hand not to exert any downward pressure as this would force the grinding wheel into the blade and would destroy its control by the hook.

84. After you have ground around the reel enough times to bring each blade to a keen sharp edge and the grinding carriage has traveled uniformly across all the blades, you are ready to take the two finishing cuts that will complete the sharpening operation. Remove the extra weight from the weight feed as the finishing cuts are much lighter. The reason for making two finishing cuts is that the grinding wheel itself wears down slightly on each pass and we must compensate for it. The feed has been increased each time on blade No.1 and when the last blade was reached, it was left just a trifle higher due to the wear of the grinding wheel. With the minimum of weight on the weight feed, turn the feed control screw about half the usual amount and grind the reel in rotation 1, 2, 3, etc. as you did before. When you finish the last blade, No.5 on a five bladed reel, go over blade No.5 again **WITHOUT INCREASING THE FEED**. This is the only time you will grind the same blade twice in succession. Go over each blade in reverse rotation, 5, 4, 3, 2 and 1. This is the second finishing cut and compensates for the wear of the grinding wheel. Each blade is now finished exactly alike.

85. Before removing the mower from the Ideal especially a hand mower, take a hand file and taper or round slightly the ends of each reel blade. This will aid in adjusting the bed knife and will prevent any clicking that some mowers tend to have at the ends of the reel blades. Later you can use the grinding head controlling it by hand to relieve the ends of the reel blades. If you have ground a hand mower, remove it from the machine and place it on a bench for final adjustment. If you have ground a power mower, leave it in the sharpener for final adjustment even though it seems a bit awkward to reach the adjusting screws. In making the final adjustment of the bed knife to cutting contact with the reel blades, remember that the pressure of the adjusting screws must be maintained so that the shape of the bed knife will not be changed. In moving the bed knife up to the reel blades with the opposed type of adjusting screws, remove a little pressure from the front screws and add the same amount to the rear screws. The bed knife should be brought up in this manner by steps until reel blades begin to strike. Once contact is made, insert a piece of paper between the blade as shown in figure 17 and turn the reel backwards so the reel blades pinch the paper from behind the bed knife. When you have the bed knife adjusted properly, the reel blades will shear

or mark the paper the same at both ends or at any point. If one end shears the paper and the other end merely marks it, the marked end is not adjusted as close as the other end. This is the only way to get both ends adjusted alike, you cannot do it by sound alone. The adjustment may sound perfect to your ear but the paper test will show if both ends are the same. You will have a perfect cutting contact at every point of each blade and the bed knife because each reel blade was ground to fit the bed knife. Grinders that do not use the Hook Grinding Principle grind both the reel blades and the bed knife to a straight line and then attempt to fit them together. Invariably a considerable amount of lapping is necessary to make them fit. This principle of grinding can be done with your Ideal and is referred to as the Straight Line Grinding Principle. It works well on the heavier lawnmowers and on greens mowers, where lapping is desired anyway, and where the construction and design is such that the minimum of distortion is obtained in the bed knife when it is clamped into the mower and adjusting pressure applied.

86. Some users of the Ideal put oil or grease on the bed knife before it is adjusted to the reel blades. The two sharp edges often cut into each other slightly as the reel blade grinding leaves a slight wire edge that must shear off. Oil or grease on the bed knife helps this condition and the reel should be turned in the reverse direction as much as possible while the bed knife is being adjusted. Some Ideal users set mowers a little tighter than usual and then explain to their customers that after fifteen minutes of mowing, the mower will free-up and then stay permanently adjusted. This allows for the wire edge to wear away and still leave a good cutting adjustment that will not have to be changed. A few vigorous shoves of the mower across your shop floor will tend to seat the reel blades and the bed knife together and will enable you to make a more permanent adjustment before the mower is turned over to your customer.

87. The reason that we have recommended leaving power mowers, particularly the home type, in the Ideal after grinding the reels is that power mower reels are driven by the engine and they, in turn, drive the wheels. This is just the reverse of a hand mower on which the wheels drive the reel. Hand mower pinions turn free and the reel remains stationary when the mower is pulled backwards while the power pinions turn free when the mower is being pushed forward. Also a power mower reel revolves backwards when the mower is pulled backwards and this makes it possible to back-lap or seat in a power mower slightly before removing it from the sharpener. Follow the same bed-knife adjusting steps as outlined above and then, using the mower wheel as a hand wheel,

revolve the reel backwards applying a small amount of lapping compound. This will remove the wire edges and make the adjustment permanent. It also improves the sound and fit of the mower.

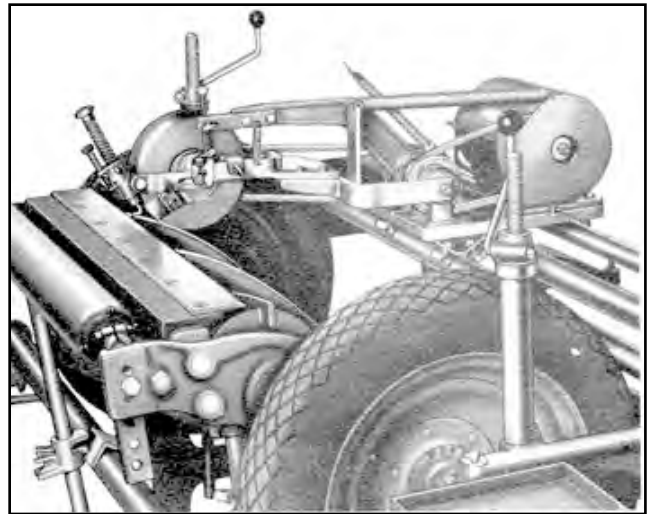
88. To simplify the steps in setting up the lawnmower in your Ideal grinder for sharpening, we will restate them. Previous instructions were complete to cover every aspect for the beginner and they undoubtedly made the setting up operation sound much more complicated than it really is. Actually, it can be broken down into three or four steps. They are, (1) place lawnmower in the machine and adjust lawnmower in and out, and up and down until, with the hook engaged under the bed knife in the middle of the lawnmower, the reel blades will pass under the wheel and within 1/8" of the wheel. (2) Lower wheel until reel blade is just striking, then lower an additional third turn of the feed control screw and set finger to give proper bevel on reel blade. (3) Using the horizontal adjustment crank, set the grinding head so wheel is scratching the same reel blade the same amount at each end of the lawnmower. (4) Hook up feed weight and grind each reel blade according to instruction. Actually these steps will become second nature and will apply to the setting of any lawnmower where the hook grinding principle is used.

89. There is little need of instruction on reassembling the mower - just follow in reverse the steps taken in disassembling it. On power mowers we suggest that the drive chain and sprockets be cleaned and the roller and other frictional points be lubricated to assure customer satisfaction. Power mowers should be started, if possible, and the reel should be run. If grass is available, a few feet of mowing will remove most of the lapping compound. However, excessive running of the reel without the removal of the compound is not recommended. Clutch and belt adjustment should be checked and the mower should be put in shape to be returned to the customer for operation. Remember, a satisfied customer is the best reputation and business builder. He will bring you more new business than any other medium. Do your part right and you will find that the Model 900 Ideal Lawnmower Sharpener is one of the best money-makers you could possibly own.

### **GRINDING REEL BLADES, WITH STRAIGHT LINE PRINCIPLE**

90. Your Model 900 idea I Lawnmower Grinder makes available a choice of grinding the reel blades by two methods or principles. The straight line grinding principle would apply mostly to the heavy duty type lawnmowers. On all reel type mowers there is some tendency for the reel to wear more at the starting end.

This means that in a few years of service the diameter of the reel is smaller at the starting end. If this were not corrected periodically it would require forcing the bed knife into a twist to make equal contact at both ends of the reel, often causing a loss of contact with the bed knife in the center. Bed knife adjustments on many heavy duty type mowers are not of the type to force or twist the bed knife to align itself with a reel that is not a true cylinder or of equal diameter at both ends. The straight line grinding principle makes it possible to square the reel with the travel of the grinding wheel both parallel and horizontally thus assuring the reel will be ground to a true cylinder of equal diameter at both ends.



**Fig. 19**

91. You further have a choice, with the Ideal, of grinding the reel by the straight line principle either in the mower frame with the reel mounted in its own bearings or completely removed from the mower frame, mounting the reel on the offset V-bearing supports provided. (See fig. 19 & 20) If the mower is of such a design that the complete reel assembly is readily removed from the frame, as many of the modern type mowers are, particularly those which have the cutting section in front and out ahead of the drive wheels or rollers, the bed knife can be set aside and the reel ground completely separate. For this operation, after the reel has been removed from the frame of the lawn mower, the offset V-rests equipped with bearings are used to hold the reel in the Ideal. (See figure 20). These offset reel support bearings are slipped on over the small V-type mower support shafts, and the mower supports then spaced so that the reel will fit on these offset V-bearings. Most reels have turned shoulders of different diameters, and the inner-most shoulder is usually the area that the reel bearings fit on. Whenever possible this area should be used.

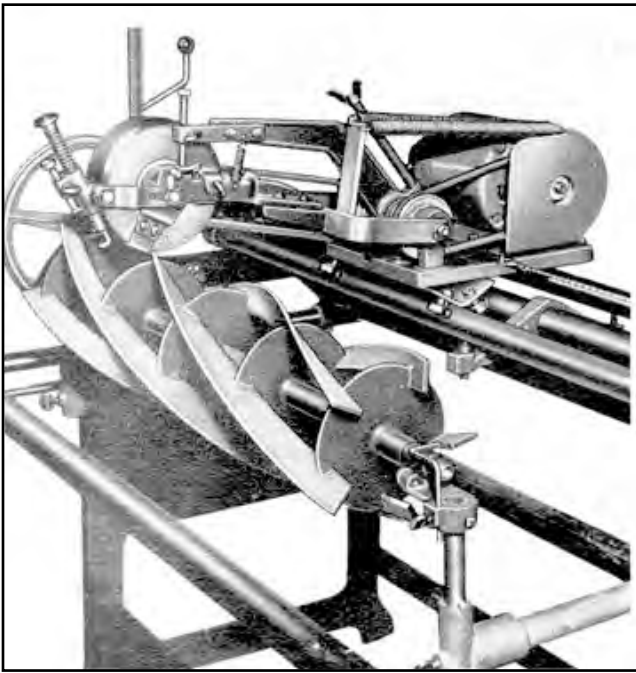


Fig. 20

92. Mowers of the type whereby their design does not lend themselves to the removal of the reel readily, such as heavy duty golf course type, can be ground with the straight line principle with the bed knife and reel installed in the mower frame. (see fig. 19) Only on mowers of this design that must be disassembled for other repair or overhaul, would it then be advisable to remove the complete reel unit from the frame for grinding.

93. After determining if the mower to be ground by straight line grinding principle is best suited for removing the reel completely or grinding the reel in its own bearings by placing the entire mower in your machine, place the reel or complete mower in the grinder, adjusting it to a position that brings the reel axle shaft approximately under the center of the grinding wheel when the grinding head has been lowered to an approximately level position as shown in figure 19. If the reel is being ground separately, remove the reel from its supports and place the roller rest pipe across the V-supports to use as a straight edge. Place a bubble type level along this pipe approximately in the center and with the vertical adjustments, level the pipe using the adjustments equally at both sides. After the pipe has been leveled the reel can be replaced and is now set true with the front guide shaft of your grinder. The center of the reel would be of equal distance from the grinding wheel at both ends. (This setting depends entirely on your grinder being set up level and it would be well to double check at this time by placing your bubble level along the front carriage shaft in the center of the ma-

chine to determine if it is level.) To grind the reel in a true cylinder it now only remains to square the reel so it is parallel with the front carriage shaft and for this adjustment the telescoping gauge supplied with your machine is used. Without disturbing the vertical adjustments and using only the side horizontal adjustments, move the reel until it is an equal distance (measured with your telescoping gauge) from the bearing area on the reel axle shaft (preferably the area supported by the V-rests) from the front carriage shaft at both ends of the reel.

94. The reel axle shaft is now set parallel and level with the grinding wheel travel and you are ready to set the proper bevel by moving the grinding wheel to the center of the reel and lowering the grinding head either with the support arm, if a broad adjustment is needed or with the feed control screw if you are within a quarter of an inch of the reel blade when turned back and forth under the grinding wheel. The same procedure for setting the bevel is used as in the hook grinding principle previously covered with the exception that the feed control screw is now the one controlling the grinding head by passing through the support arm and bearing against the grinding wheel supporting fork as shown in figure 20. Using this feed control screw, lower grinding wheel until contact is made with the reel blade. Rotate reel blade toward you from in under the grinding wheel and lower grinding wheel an additional one quarter to one third turn of the feed control screw. Rotate reel blade back and against the grinding wheel (it will no longer pass under the grinding wheel due to the amount you have lowered it) at this point of contact, rotate bevel control finger down and against the reel blade and the bevel is set. (See fig. 20). You are ready to grind and no other adjustments are necessary. If you find, while grinding, that contact is heavier at one end of the reel than at the other, it is due to the reel being smaller in diameter at one end than at the other. (Remember your reel has been squared up both ways under the grinding wheel and with its line of travel thus assuring a true cylinder when grinding has been completed.) Number reel blades and start grinding in whichever direction permits the contact of the grinding wheel to cause the reel rotation and hold the reel blade against the control finger. After grinding to the extreme end of the first blade, to return the grinding head to the starting end, permit the back side of the bevel control finger to rub against the reel blade and cause the reel rotation necessary to return the grinding head to the starting side of the reel. Engage reel blade number two and repeat the grinding procedure as outlined in the preceding instructions for grinding reel blades.

95. If the reel to be ground is to remain in the mower frame and mounted in its own bearings, the setting up

procedure will vary only slightly to those covered above for grinding a reel when completely removed from the mower. On some mowers, the bed knife assembly need not be installed, however in most cases this assembly ties the rear section of the mower frame together and provides proper spacing for the reel bearings. In as much as it will not interfere with the reel grinding, it is recommended to have it in place (see figure 19). It will not be possible to use the telescoping gauge from the ends of the reel axle, however an accurate check can be made by using the gauge against the reel axle shafts as far toward each end as possible, usually beside the first reel spider in from each end. To level the reel, it would be advisable to use a short piece of pipe of sufficient length to reach from the same position on the reel axle shaft and extend straight up, slightly above the reel blades. The grinding wheel can then be lowered to make a light rubbing contact with this spacing rod or pipe and then the reel rechecked at the opposite end with the grinding wheel and using the side vertical adjustments, the reel squared until the wheel contact with the gauge is equal at both ends. By this method the reel has once again been squared with the front guide shaft and leveled with the grinding wheel travel thus assuring a true cylinder grind when all blades have been ground down equal and to a new cutting edge.

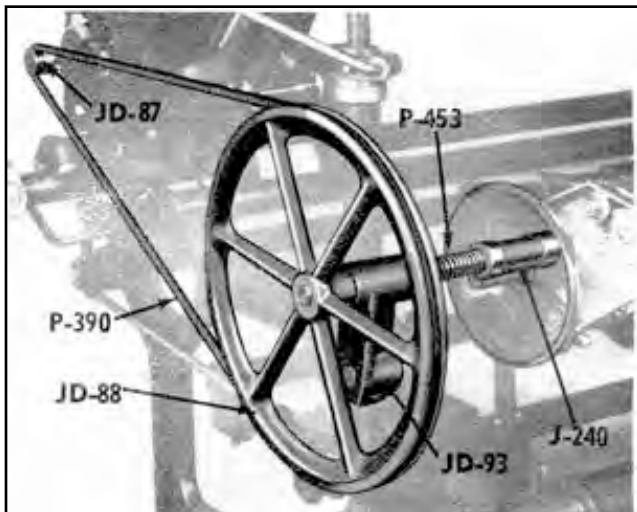


Fig. 21

96. In the above instructions it will be up to the operator to make his choice of which of the three methods to use in grinding the reel blades. Different mowers will lend themselves better to the different methods and principles involved. It is desirable, wherever possible, to allow the reel to turn in its own bearings. However, some mowers cannot be ground by the straight line method with the reel turning on its own bearings without having the bed knife assembled in the mower, as the reel bearings would not be in

proper adjustment. After a few more mowers have been ground, and experience gained, you, the operator, will be able to utilize the many advantages in the Ideal and select the best method and procedure for grinding each particular mower.

### INSTRUCTIONS FOR RECONDITIONING

97. The Reconditioner is supplied with the Model 900 Ideal Sharpener to provide a means of "lapping-in" mowers after they have been ground. (See figure 21). While the reconditioner is not essential to complete a good grinding job, it has many applications on different types of mowers. We will explain when and how it can be used to advantage.

98. To use the reconditioner for lapping-in, we recommend that hand mowers be placed in the Ideal right side up or the reverse of the position used for grinding. The left hand wheel and pinion gear must be removed. Raise the roller rest so that the bed knife of the mower is inclined downward. This causes the lapping compound to flow back into the reel blades after being wiped off on the bed knife, thus it is reused. The adjustable mower supports provide a quick setting of the mower to the point where the reel shaft can be coupled to the reconditioner. The reconditioner drive shaft can also be aligned with the reel shaft axle before the coupler is placed on, as the spring on the reconditioner shaft allows end movement sufficient to place the coupler on the reel shaft after the reconditioner guide shaft is aligned.

99. The reconditioner attachment can be driven in either direction by crossing the drive belt. Power mowers may be placed in the Ideal upright or inverted, as the Reconditioner has the added advantage of being able to drive in either direction. The ratchet pawl of the mower can sometimes be used as a driving key for the coupler. However, in some cases the pawl is too short and it will be necessary to make a driving pin from 3/16" rod or 1/4" x 3/4" flat stock, depending on the type of pawl used in the mower. Most mowers have a 5/8" diameter reel shaft which will require the use of a 5/8" bushing in the driving coupler. Three sizes of bushings are supplied and you can select the proper one to use with the mower.

100. On some mowers the drive will have to be through a socket on a nut which is located on the end of the reel shaft, used to retain the bearings. If the socket supplied with your Reconditioner accessories does not fit, any tool box socket can be used as there is a square socket driver supplied which will accommodate a tool box type socket. After centering the driving pin or pawl in the reel shaft, and slipping the driving coupler on, you are ready to start the motor,

and apply the compound on the reel blades as they turn backwards, using at least a 2" brush for this application. The rest of the operation is automatic and additional compound is applied as needed. If you wish to lap the mower completely, continue to apply the compound until the reel is no longer making contact with the bed knives. If you merely wish to lap it in and leave contact, then stop the lapping operation after three or four minutes, when it is noticeable that the reel speeds up and the sound affirms that the contact of the reel knives with the bed knife is much lighter than when the lapping operation was started.

101. After the mower has been lapped in, remove the compound either by using a rag or by pushing the mower in the grass. If the adjustment is too light, the bed knife may be set up a little and you may be assured that the final adjustment will be permanent as the blades have seated together and the wire edge has been removed.

102. There are a few mowers that are not driven by the conventional pinion and pawl. These mowers use a new type of pinion gear without the standard pawl to drive the reel. Some power mowers use a new type of pinion gear keyed to the shaft without any slots to use a driving key or pawl. On mowers of this type, a Jacobs Chuck can be used to grip the reel shaft for lapping in. A less expensive alternate is to drill and tap a hole in the side of the driving coupler for a set screw to clamp against the reel shaft. Another possibility is to use a short length of rubber hose and hose clamps to make the coupling. Some Golf Course mowers have hex head driving nuts on the ends of the reel shaft and the hex sockets supplied, or sockets from a standard socket set, can be used for coupling to this type of drive. Bear in mind that, when lapping, you are wearing away the bed knife four or five times faster than anyone reel blade, therefore lapping should be kept at a minimum.

103. There are mowers on the market today known as the silent type and these must be lapped out until the reel blades no longer make actual contact with the bed knife. Most of these mowers are of steel construction and if there were actual metal to-metal contact between the bed knife and the reel blades, the vibration and noise would be objectionable. The more popular mowers of this type are the Silent Yardman, Michigan Noiseless, and the Sears & Roebuck Craftsman. The principle of the Silent lawnmower is simply that the reel blades do not actually touch the bed knife but clear by about 1-1000th. of an inch. This type of mower is sharpened in the regular way and the bed knife is adjusted to contact the reel just as any other mower. Then, using the Reconditioner, lapping is continued until the reel blades no longer touch

the bed knife. The use of our ready mixed compound (fine) will give the necessary 1-1000th. of all inch clearance and the mower will readily cut grass or paper, yet be silent. Do not continue the lapping operation until the mower is completely silent as the compound itself will continue to make some sound, even after the blades are no longer touching. When you think it has lapped-in long enough, wipe off the compound and test to see if it is silent. Any well constructed mower can be made into a silent mower, the prime requirement is good reel bearings. Such a mower could be lapped in until it was silent.

104. Some shops doing a large mower business find it advantageous to have a separate lapping machine. We manufacture a portable lapping head or a complete machine in our Simplex Reconditioner. If your business grows to this point and the use of the reconditioner on your Ideal delays production, the answer is our Simplex Reconditioner, Model 150.

105. It is important to impress upon your customer the fact that he should not attempt to adjust a silent mower or a conventional mower that you have lapped out. Any adjustment is next to impossible due to the fine amount of clearance which was achieved by lapping. To change the adjustment would be to change the mower to a conventional type with the bed knife and reel in actual contact. A silent mower should be used until it will no longer cut satisfactorily, then be returned to your shop for adjustment and reconditioning with the lapping process. After one or two reconditionings, it will be ready for grinding again.

### **SHORT CUTS ON SHARPENING MOWERS**

106. Perhaps the biggest short cut for sharpening a mower would be not to sharpen it by grinding at all. Careful inspection should always be made to determine the amount of bevel or clearance behind the cutting edges of both reel blades and the bed knife and the condition of these edges. Often times a mower is deemed by the users to need sharpening when adjustment of reel bearings and the bed knife would be all that was required to return the mower to good cutting condition. Sometimes the above is true with the added requirements of a little lapping-in with your reconditioner attachment. Inspection may reveal the bed knife only requires grinding and when replaced, the fit between the reel blades and the bed knife with the aid of lapping is restored to first class cutting condition. The above may be true with the exception of one reel blade and in the following paragraph we will tell you how to remedy this condition.

107. After the bed knife has been ground and replaced in the mower and while adjusting it to clear the

reel blades equally, a calling card thickness, at both ends, it may be noticed that one or two of the reel blades are considerably higher and strike the bed knife long before the others could make contact. Rather than setting the mower up and grinding these high blades down to match the others, close inspection may show the cause of a blade being high to a bent or sprung condition. If a reel blade strikes a solid object, often times it is sprung back and this likewise causes it to stick out or to be high as compared with the others. This condition can often be remedied by blocking the reel and using a good sized wrench on the reel blade to spring it forward and thus back into place, eliminating excessive grinding.

### CAUSES OF POOR RESULTS

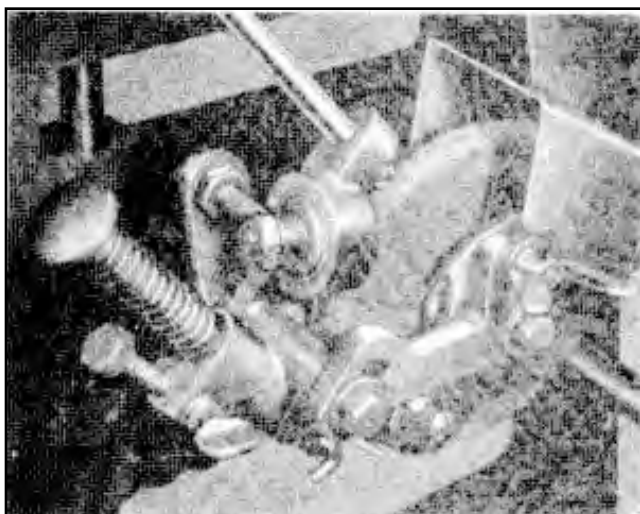
108. After grinding, reel blades making contact at the ends and not cutting in the middle could be caused by the following: (1) Grinding in wrong direction, forcing bevel control finger to cause reel to turn. This pressure sometimes draws grinding head down and into the work causing excessive grinding in center area leaving ends high. (2) In making final adjustment of bed knife to reel blades, more pressure has been exerted on adjusting screws than was applied when mower was prepared for grinding, increased pressure of these screws causes the bed knife to distort more and spring away in the center further. Thus contour of the bed knife which served as a guide for grinding the reel blades has been changed, and a fit no longer can be expected. (3) Too much drag on the reel, not permitting it to rotate freely while grinding. (4) Mower improperly set up in machine, not squared with the grinding wheel travel for either scratching contact with grinding wheel at each end. Face of reel blades dirty. Finger point out of adjustment and too far away from grinding wheel causing finger to contact reel blade too far below cutting edge and binding. (5) Spreader hook assembly out of adjustment, not kept moved in to take up for wheel wear. Spreader hook shaft should be in as close as possible to back side of finger when same is rotated as far back and up toward you as possible.

109. High tips left on end of reel blades by grinding head not grinding to extreme ends causing clicking and making proper bed knife adjustment difficult if not impossible. These results are caused by grinding wheel not being properly dressed. Grinding is taking place off center on grinding wheel face permitting the finger to reach the end of the blade and disengage same before grinding point has reached end of the blade. When grinding wheel is dressed so crown or highest point of the grinding wheel face is in the center directly behind finger point and in line with hook, when hook and finger has reached the ends of the blades being ground, grinding action will have like-

wise continued to this point. See following section entitled "Instructions for Dressing the Grinding Wheel."

110. Intermittent hitting reel blades, a puzzle? When the spiral knives or reel blades wipe the bed knife one time around and miss another time, it is probably one of these ailments: (1) A self adjusting mower with the cones mounted on the reel shaft or the cones mounted on a light stamping which has broken and allows the cone to turn. Nothing but a new bearing will overcome this. (2) A loose bushing revolving around the shaft. (3) A cracked or broken ball in the ball bearing. (4) A flat roller in the roller bearing. There is nothing to do but to take out the shaft and replace the defective parts. If you have already ground the reel blades before finding this fault, you will have to re-grind them after the new parts are installed. Be sure and examine every mower carefully for these faults before grinding. These defects are rarely found but, when they are, it is a problem for a beginner.

111. Cause of wavy wipe of reel blades on the bed knife. (1) Loose reel bearings. (2) Spring tension, self-adjusting ball bearings. (3) Cutting edge of bed knife protruding too far under, or ahead, of center of reel shaft. Set of bed knife does not tip slightly up at the front edge but sets too flat in relation to the reel blades. These troubles are probably caused by some one replacing the bed knife with one that is wider than the original or, in the case of the non-lipped bed knife, one that has simply been ground too far back. To remedy these conditions: (1) Take up loose bearings. (2) Put new springs behind self-adjusting bearings. (3) Take out bed knife and grind front edge back if it is too wide and a wide wiping contact is being made. (4) Either shim down the back edge of the bed knife thereby throwing the front edge up or take the bed knife out and grind more clearance behind the cutting edge. Be sure to make the above repairs before grinding in the reel blades. The above conditions will rarely be found in present day mowers but occasionally you may receive the old-type mowers which have the non-lipped or flat bed knife on which someone has replaced the original bed knife with one of improper width or thickness. We are elaborating on these possibilities because they are difficult to figure out and you may meet these conditions among the first mowers that you get.



**Fig. 22**

### INSTRUCTIONS FOR DRESSING THE GRINDING WHEEL WITH W-185T DRESSER

112. Figure 22 shows the W-185T Grinding Wheel Dresser being used. This mechanical dresser is mounted on a sealed ball bearing and enables you to keep your wheel dressed to the proper crown a tall times. It also enables you to keep your wheel perfectly round and thus eliminate the possibility of your wheel becoming egg shaped which would cause excessive vibration. You will notice that the grinding wheel has a tendency to wear flat and at an angle. This is caused by the spiral of the reel blades. Grinding should always be done in the center of the grinding wheel directly behind the P-256C finger point and in line with the J-25C hook. This dresser mounts on the cap screw holding your spreader assembly which has been left longer than needed to accommodate the dresser. As shown in figure 22 the dresser is held on by a wing nut and it need only be adjusted the first time it is used. The dresser is adjusted side ways by the two nuts on the supporting eye bolt that attach the dresser to the connecting link which is held by the wing nut. This lateral adjustment should be made so when the diamond dresser is extending straight up and down the point, or diamond, is at the middle of the grinding wheel face. The diamond dresser holder assembly should also be rotated so the diamond dresser is pointing toward the center of the grinding wheel.

### DON'TS AND CAUTIONS

1. Do not attempt to grind mowers until you study these instructions carefully.
2. Do not grind a good mower until you are familiar with the sharpener, practice on an old one.

3. Use plenty of kerosene oil in pinion gears, clutches, dogs, or ratchets of a mower. This makes slipping clutches grab and hold fast. It also saves installing new ratchets or pawls when not actually needed.

4. Do not force set screws, adjusting screws, or bolts. Use a rust-removing penetrating oil on them or heat them quite hot with a torch to loosen them.

5. Do not forget that by forcing adjusting screws or bolts, you can easily break a lawn mower frame casting.

6. Do not try to tighten one adjusting screw without loosening the opposing adjusting screw, something may break.

7. Do not force the adjusting screw if the bed knife does not set up to the reel blades. The pivot points at the ends of the bed knife may be rusted fast to the mower frame or the opposite adjusting lug may be dead against the frame with all the adjustment taken up. Take the bed knife out and grind off the lug to fit.

8. Do not use case hardened pawls, dogs, or pins in the pinion or drive gears of a mower. They cut out notches rapidly. It is cheaper to replace pawls than pinion gears.

9. Do not fail to keep the J-25C hook set as close to the grinding wheel as possible. See figure for the correct setting.

10. Do not use extra weight on the weight feed for thin-bladed mowers. If the cut is too light, retard the travel of the grinding head by hand.

11. Hold the grinding head when it disengages from under the bed knife at the end of the blade. Do not allow the grinding head to fly up when the hook is released.

### INSTRUCTIONS FOR ORDERING

1. Give the serial number of your machine with each order for parts. This serial number is stamped on the name plate which is fastened to the left hand main frame. This is very important to assure that you will receive the proper parts for your machine.

2. Order by part number from the Parts and Price List which covers your machine. Give all the information you can.

3. Please observe the terms stated on the Parts and Price List. We cannot open ledger accounts for parts orders.

4. Be sure your name and address is on your order, we do not save the envelopes so your address on the envelope is not enough.

5. If at all possible, anticipate your needs and order early. Our busy season lasts from February to May and we may be several days behind on shipments during this period.



# Repair Parts Price List

MODEL 900

# IDEAL Lawnmower Sharpener

SERIAL NUMBER 35,200 UP

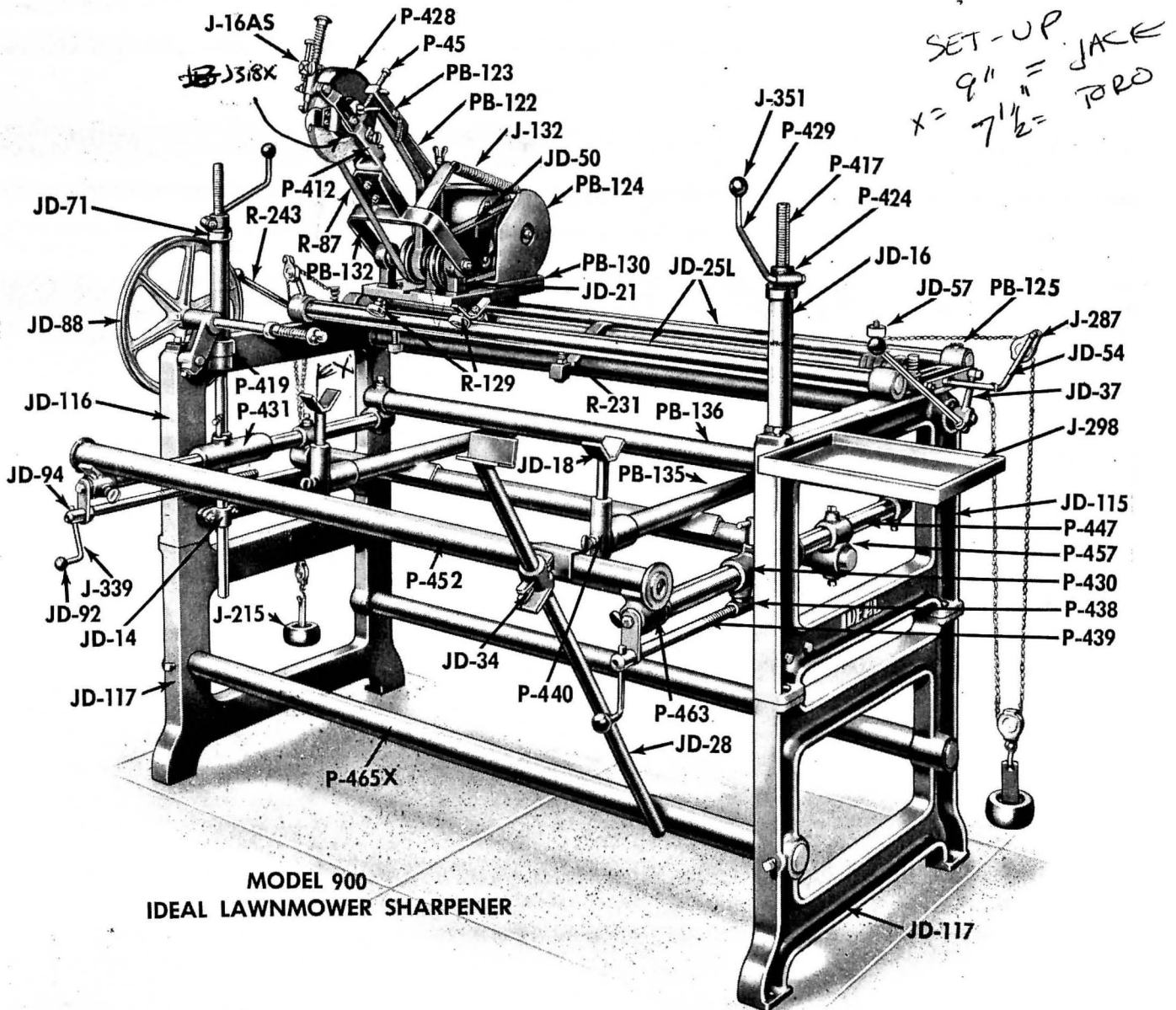
EFFECTIVE JANUARY 1, 1961

**IMPORTANT:** ORDER PARTS BY PART NUMBER AND GIVE THE SERIAL NUMBER OF YOUR MODEL 900 IDEAL SHARPENER. WE CANNOT GUARANTEE THAT YOU WILL RECEIVE THE CORRECT PARTS UNLESS WE CAN CHECK YOUR SERIAL NUMBER.

The serial number is stamped on the metal plate which will be found on one of the side frames. Changes have been made from time to time which make it necessary to check parts ordered against the serial number. Be sure to put this serial number on each order.

Please send sufficient remittance with order to cover cost of parts, postage and insurance. Any overpayment will be promptly refunded. Orders without remittance will be shipped C. O. D.

**NOTE:** All Prices Quoted are F.O.B., Plymouth, Ohio, Subject to Change without Notice



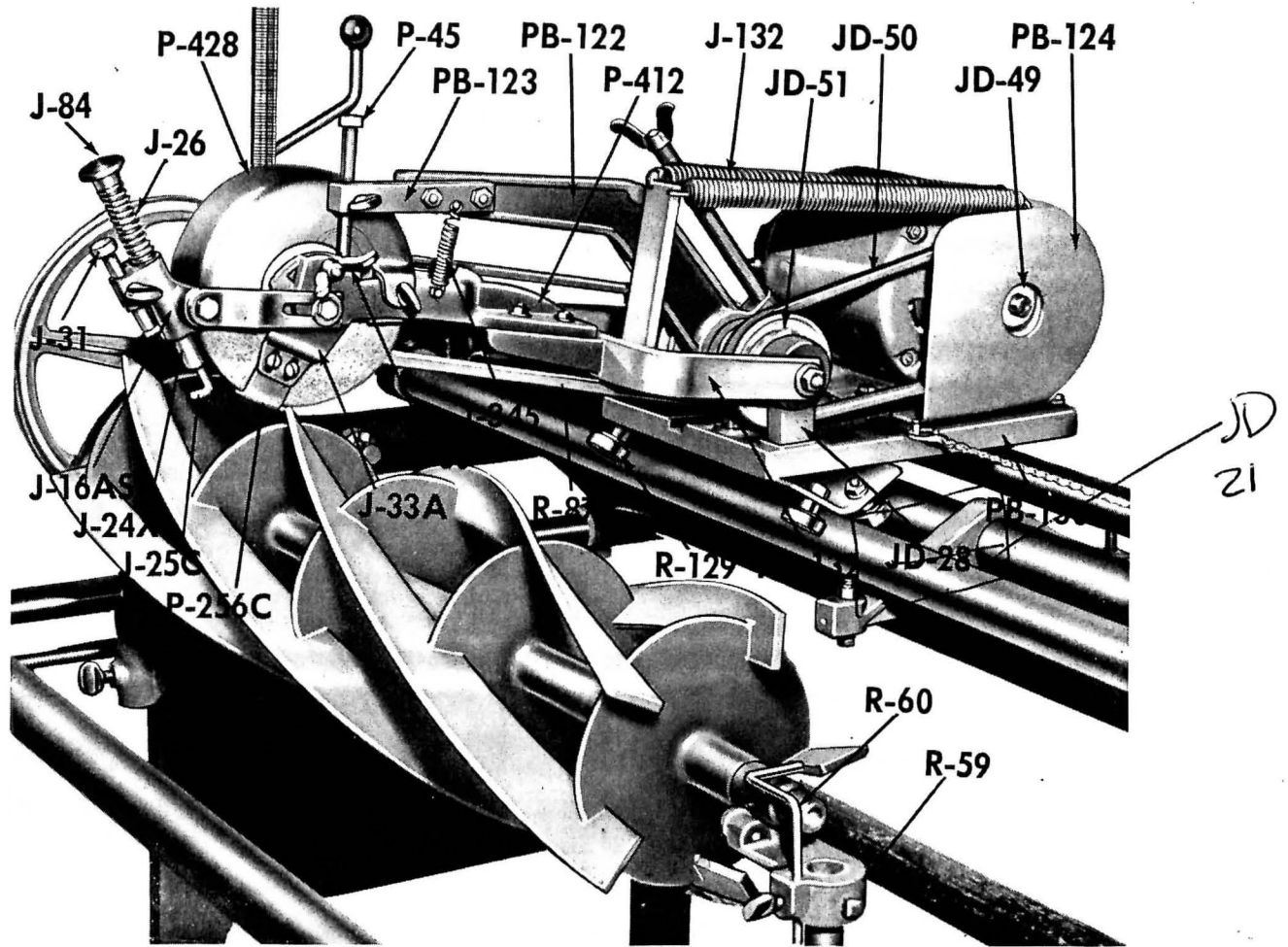
MODEL 900  
IDEAL LAWNMOWER SHARPENER

## THE FATE-ROOT-HEATH COMPANY

SPECIAL PRODUCTS DIVISION

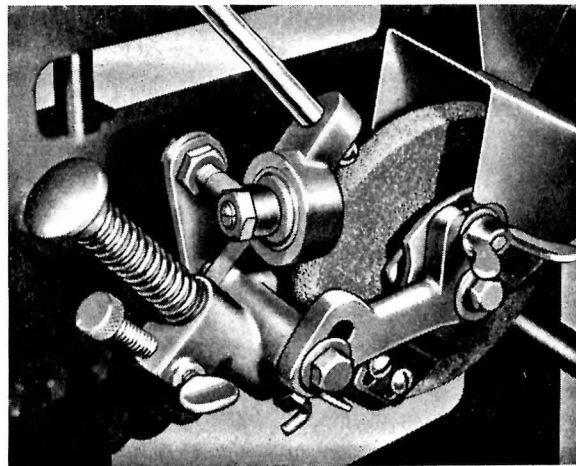
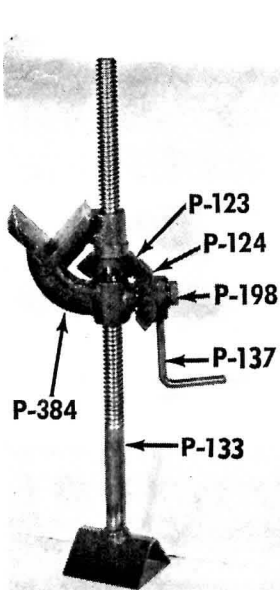
PLYMOUTH, OHIO, U. S. A.

Order No.	Description	Price Each	Shipping Weight
J-16	Spreader Casting only	\$ 4.05	12 oz.
J-16AS	Spreader Assembly complete with J-25C Hook	7.65	20 oz.
J-24X	Hook Shaft	1.25	6 oz.
J-25C	Hook, carbide tipped	1.25	3 oz.
J-26	Spring for J-24X Hook Shaft	.25	2 oz.
J-28C	Finger Point, carbide tipped	1.65	3 oz.
J-31	Knurled Adjusting Screw	.35	3 oz.
J-33A	Finger Point Holder	.90	3 oz.
J-36	Nut for J-318X Hub	1.25	2 oz.
J-42	Washer for J-318X Hub	.15	2 oz.
J-71	Pin, 5/32" x 1", for J-24X	.10	1 oz.
J-79	Brass Plug in J-16 Spreader	.05	1 oz.
J-80	Wing Nut	.25	2 oz.
J-84	Knob for J-24X Hook Shaft	.50	2 oz.
J-132	Counterbalancing Spring	.65	5 oz.
J-153	Sleeve for J-240 Coupler	.30	2 oz.
J-164	Bushing, 5/8", for reconditioner	.30	3 oz.
J-164A	Bushing, 9/16", for reconditioner	.30	3 oz.
J-164B	Bushing, 1/2", for reconditioner	.30	3 oz.
J-215	Feed Weight, Large	2.25	3 lbs.
J-216	Feed Weight, Small	.50	8 oz.
J-232	Pin in JD-89 Shaft	.10	1 oz.
J-234	"S" Hook for JD-55 Chain	.10	1 oz.
J-240	Driving Coupler for reconditioner, with sleeve	1.40	1 lb.
J-287	Feed Weight Pulley	.25	3 oz.
J-316	Ball Bearing, #8013 N. D.	3.10	3 oz.
J-316X	Ball Bearing, #87013 N. D.	1.15	3 oz.
J-318X	Grinding Wheel Hub complete, not sold separately	8.95	2 lbs.
J-319	Arbor for J-318X Hub	.65	3 oz.
J-339	Crank for JD-94 Collar	2.25	5 oz.
J-345	Spring	.15	2 oz.
JD-14	Lower Guide Bearing	2.15	8 oz.
JD-16	Support Pipe	.95	1 lb.
JD-17	Mower Support "V" Rests, small with point	2.45	1 lb.
JD-18	Mower Support "V" Rests, large	.95	2 lbs.
JD-21	Arm Support Bearing	3.75	1 lb.
JD-24	Countershaft 5/8"	.25	1 lb.
JD-25L	Carriage Shaft, 1 1/16" Dia. x 55"	10.25	28 lbs.
JD-28	Roller Support Pipe and "V" Rest, welded	.55	2 lbs.
JD-31	Carriage Adjusting Links	.75	8 oz.
JD-32	Carriage Adjusting Bushings	.30	2 oz.
JD-33	Carriage Adjusting Lever	.95	8 oz.
JD-34	Roller Support Jack	2.15	1 lb.
JD-35X	Shaft, 3/4" Dia. x 3 1/2"	.95	6 oz.
JD-37	Adjusting Crank, forged	2.15	1 lb.
JD-49	"V" Pulley, 4 1/2" O.D., 5/8" bore	1.00	2 lbs.
JD-50	"V" Belt, motor to countershaft	.95	5 oz.
JD-51	"V" Pulley, 3 1/2" O.D., 5/8" bore, on countershaft	1.05	2 lbs.
JD-54	Feed Weight Pulley Holder	.65	8 oz.
JD-55	Feed Weight Chain, with hooks	.35	6 oz.
JD-56	Pin for P-428 Stop Collar	.30	3 oz.
JD-57	Rubber Bumpers	.20	2 oz.
JD-69	Clamp Screw	.30	4 oz.
JD-70	Clamp Screw Handle Groove Pin	.05	1 oz.
JD-71	Thrust Bearing under P-424 Nut, Nice #608	.95	6 oz.
JD-74	No. 5 Groove Pin, 1/4" x 1 1/4"	.05	1 oz.
JD-85	Bearing in JD-93 Bracket, Torrington #BL 1016	.65	4 oz.
JD-86	Fibre Plug 1/8" x 3/16"	.05	1 oz.
JD-87	"V" Pulley for motor, 1 1/4" O.D., 5/8" bore	.45	12 oz.
JD-88	"V" Pulley, reconditioner, 12" Dia.	3.15	2 lbs.
JD-89	Pulley Shaft, 5/8" Dia. x 16"	1.05	1 lb.
JD-92	Plastic Knob for J-339 Crank	.15	3 oz.
JD-93	Bearing Bracket for reconditioner	3.75	2 lbs.
JD-94	Crank Collar	.55	4 oz.
JD-115	Main Frame, right side	24.50	24 lbs.
JD-116	Main Frame, left side	24.50	24 lbs.
JD-117	Sub-base	24.50	25 lbs.



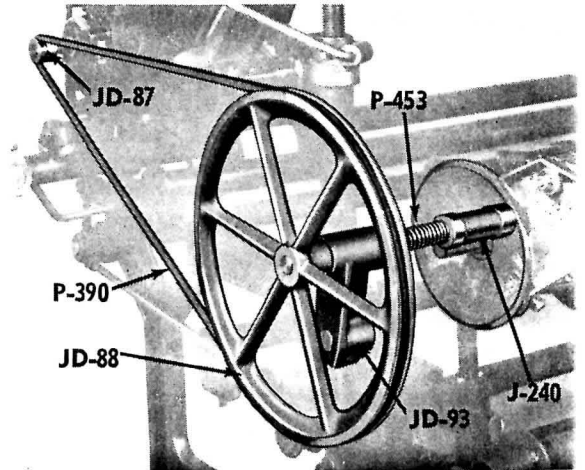
Order No.	Description	Price Each	Shipping Weight
P-27	Set Collar, 5/8" I.D.	.45	4 oz.
P-45	Screw	.25	4 oz.
P-54	Driving Coupler, 1/2" Square	1.05	3 oz.
P-256C	Finger Point	.45	2 oz.
P-288	Height Gauge	2.75	10 oz.
P-350	Spring	.10	1 oz.
P-368	Hex Socket, 25/32", for reconditioner	.85	4 oz.
P-369	Hex Socket, 1 1/32", for reconditioner	.85	4 oz.
P-373	Swivel Pin	.35	2 oz.
P-389	Groove Pin, 1/4" x 2 1/2", in JD-69	.05	1 oz.
P-390	Round Belt for Reconditioner Drive	2.95	6 oz.
P-412	Arm	4.50	14 oz.
P-413	Link for Arm and Spreader	.25	5 oz.
P-417	Elevating Screw	12.50	5 1/4 lbs.
P-419	Elevating Screw Support	12.50	1 1/2 lbs.
P-421	Arm Support Bearing	5.65	1 1/2 lbs.
P-424	Elevating Nut	.15	12 oz.
P-429	Crank	.65	6 oz.
P-430	Support Frame Holder, right side	2.50	3 1/2 lbs.
P-431	Support Frame Holder, left side	2.50	3 1/2 lbs.
436	Bed Knife Knuckle	2.50	2 lbs.
r-438	Horizontal Adjusting Nut	1.05	9 oz.
P-439	Horizontal Adjusting Screw	2.45	1 1/2 lbs.
P-440	Support Knuckle on end of 1" pipe	5.45	1 1/2 lbs.
P-446	Link on ends of P-447 Shafts	.95	8 oz.
P-447	Main Support Shaft, 1 1/4" x 32"	6.95	11 lbs.

Order No.	Description	Price Each	Shipping Weight
P-452	Roller Rest Pipe, 1 1/4" x 50 1/4"	3.65	10 lbs.
P-453	Spring on Reconditioner Shaft	.15	2 oz.
P-457	Knuckle for Cross Support Pipe	3.45	1 1/2 lbs.
P-458	Pipe 1/4" x 6"	.55	2 lbs.
P-463	Roller Support "V" Rest	2.65	18 oz.
P-465X	Sub-base Spacer Pipe 1 1/4" x 55 3/4"	4.95	10 lbs.
P-468	Bolt, 5/16" x 8"	.20	4 oz.
PB-52	Fibre Washer, 5/8" hole	.05	2 oz.
PB-108	Ball Bearing, Nice #6184	1.75	2 oz.
PB-122	Lever	5.45	2 3/4 lbs.
PB-123	Block	3.85	10 oz.
PB-124	Guard & Spring Holder	8.85	1 5/8 lbs.
PB-125	Track Supports	17.95	3 3/4 lbs.
PB-126	Pipe Support Bearings	0.55	1 lb.
PB-130	Carriage Base	20.50	13 lbs.
PB-131	Bearing Holder	1.55	6 oz.
PB-132	Arm Holder Bar & JD-23	8.95	2 1/2 lbs.
PB-133	3/4" Adjusting Shaft	3.55	7 1/2 lbs.
PB-134	Spacer Pipe, 1 1/4 x 55 1/2"	4.45	10 lbs.
PB-135	Mower Support, 1" x 21 1/2"	9.95	3 1/2 lbs.
PB-136	Cross Support Pipe 50 1/4" Long	2.95	9 1/2 lbs.
PB-137	Pipe for R-231	3.95	9 1/2 lbs.
R-87	"V" Belt, countershaft to grinding wheel	1.45	4 oz.
R-129	Ball Bearing, N.D. #77501	2.75	2 oz.
R-129X	Ball Bearing, N.D. #87501	3.20	2 oz.
R-198	Key, 1/8" x 3/8" x 1 1/8"	.15	2 oz.
R-225	Axle	.45	5 oz.
R-231	Support	6.95	3 lbs.
R-241	Bushing	.75	6 oz.
Motor	1/2 H.P., 1725 R.P.M. Double Shaft, 60 cycle 115 volt	24.95	22 lbs.
Grinding Wheels — Lapping Compound — See current wheel list			



W-185—Diamond Dresser Holder—Radius Type

This diamond dresser holder is designed to use the W-180 Diamond Dresser in dressing the traveling, grinding wheel on the Ideal or Peerless Sharpener. See current grinding wheel price list.



RECONDITIONER

The Reconditioner is illustrated as used on the Ideal Sharpener, however, part numbers are the same on Peerless. Peerless Reconditioner - - - - - \$19.95

The Peerless Roller Support Screw Jack. The complete assembly is available as pictured at left. Order No. P-384AS — Price \$14.95, Shipping Weight 6 lbs.

# THE FATE-ROOT-HEATH COMPANY

## SPECIAL PRODUCTS DIVISION

### PLYMOUTH, OHIO, U. S. A.