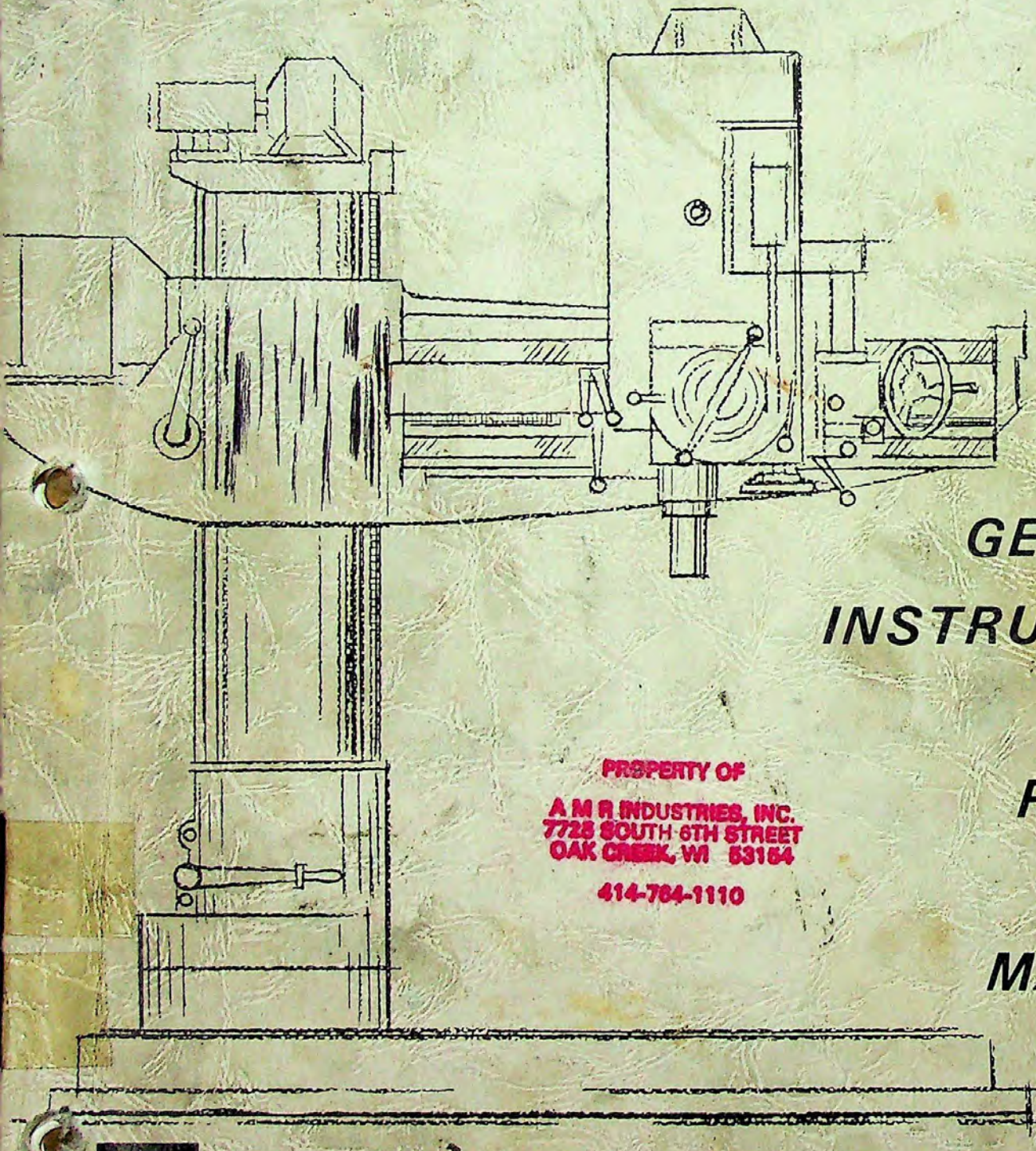
2325

MANUAL R-18B

RADIAL DRILLING MACHINE

WITH 11, 13, 15, 17 OR 19" DIAMETER COLUMN



GENERAL INSTRUCTION AND REPAIR PARTS MANUAL

GIDDINGS & LEWIS–BICKFORD MACHINE COMPANY
KAUKAUNA, WISCONSIN U.S.A. 54130
A DIVISION OF GIDDINGS & LEWIS, INC.

PREFACE

This manual provides basic information about the machine and equipment. Instructions and suggestions are given to insure proper operation and care.

The machine illustrated and described in this manual is protected by United States and foreign patents, patents pending or applied for. The illustrations and specifications are not binding in detail. We reserve the right to make changes at any time, without notice, in materials, specifications, parts or equipment without incurring any obligation to equip same on machines built prior to date of such change.

Should problems arise or information not covered by this manual be required, contact the Service Department.

Giddings & Lewis–Bickford Machine Company
820 Hyland Avenue
Kaukauna, Wisconsin, U.S.A. 54130

Manual #R-18B

TELEPHONE
Area Code 414
Number 766-4631

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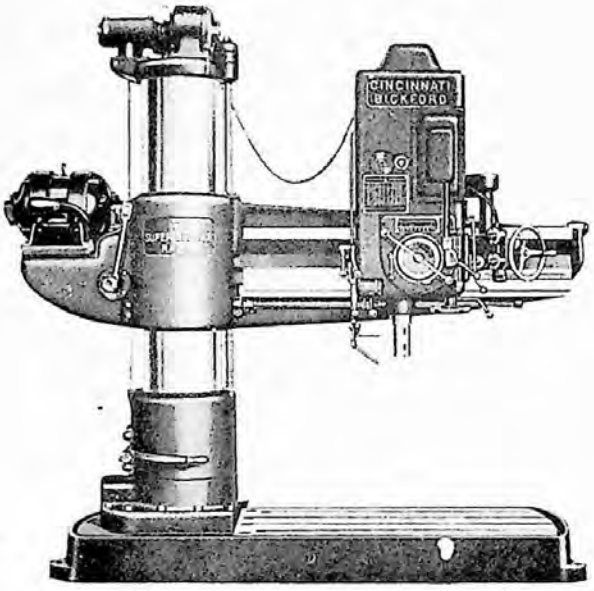
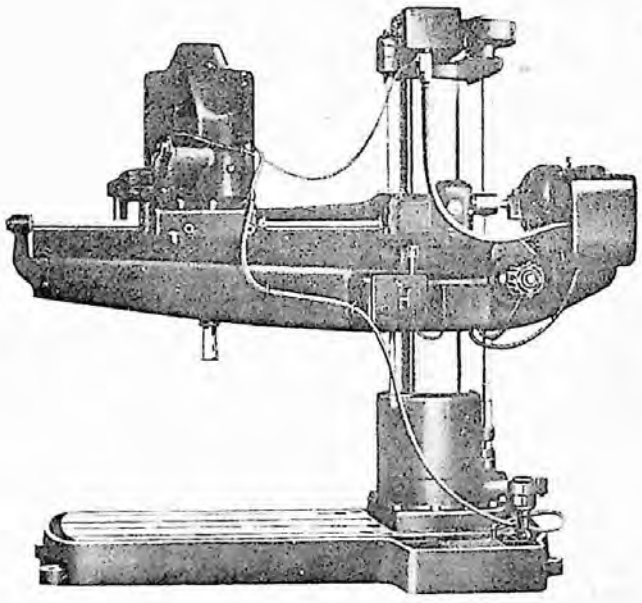
26-3454

G&L Form No. 2081 - 11/72 - 200
6/75 - 75
12/76 - 150

Give Your Radial Drill
A Square Deal





Your SUPER-SERVICE Radial Drill is a finely made tool. It has been built with painstaking care and accuracy to insure your having the best in radial drills.

All of its mechanism is completely enclosed. Its oiling is automatic and it is protected by every practical accident prevention feature -- but, if you want years of uninterrupted service with low upkeep cost, there are two things that must be observed:

> The machine should be properly installed. It should receive intelligent care and treatment, after it has been placed in service.

This booklet contains detailed instructions for the installation, operation and care of the SUPER-SERVICE RADIAL. It should be thoroughly studied by the man in charge of erection, the radial drill foreman, the operator and by the man in charge of maintenance. The instructions in this book should be carried out in detail.

In conclusion, remember that no radial is better built than the SUPER-SERVICE Radial. Remember, too, that no machine tool, regardless of how well it is built, will stand up for a long. period under abuse, neglect or indifferent treatment.

Give your SUPER-SERVICE Radial a square deal and it will serve you well.

ERECTING

Unloading

For the information of the erecting crew, the following hoisting weights of the SUPER-SERVICE Radials are given:

3' arm,	11"	column,	9,300 lbs.
4' "	11"	"	9,800 lbs.
4' "	13"	"	10,900 lbs.
5' "	13"	"	11,600 lbs.
4' arm	15"	column	12,800 lbs.
5' "	15"	"	13,700 lbs.
6' "	15"	"	14,800 lbs.
5' arm	17"	column	17,300 lbs.
6' "	17"	"	18,300 lbs.
7' "	17"	"	19,600 lbs.
6' arm	19"	column	22,400 lbs.
7' "	19"	"	23,600 lbs.
8' "	19"	"	24,900 lbs.

Before unloading from car, observe the following precautions:

1. Do not remove the waterproof covering from the machine until it has been set in place.

2. Make certain that the lever marked "A," Fig. 1, is pushed downward as far as it will go.

3. Place a sling, preferably of manila rope, around the arm as shown on Fig. 1. The ways of the arm and the arm shaft are covered with heavy blocking to protect them from the sling. Care should be taken when placing the sling to see that it rests on this blocking. Put a rope hitch around the top of the column and the sling as shown. Take a light strain on the sling with the crane to make sure everything is all right before hoisting.

Fig. 1

Foundation

Where the machine is located on the ground floor, we recommend that a concrete foundation, having a depth of at least three feet, be provided in accordance with foundation plans shown in Fig. 5. The foundation bolts should be so arranged before pouring, that they can be moved about one inch in any direction after the foundation has set. This is to allow for slight errors in locating these bolts. Fig. 2 illustrates such an arrangement.

Where most of the work has considerable height, it is good practice to locate the top of the foundation so that the working surface of the base is about $2\frac{1}{2}$" above the floor level. This brings the machine considerably lower than would be the case if it were resting on the floor. This is much more convenient for the operator when handling large work. However, where most of the work has very little height, nothing would be gained by such an arrangement. When figuring the height of the foundation, an inch to an inch-and-a-half should be allowed, between the base and the top of the foundation for grouting.

In the case of a machine installed above the ground floor of a building, we recommend placing it on the strongest part of the floor, preferably near a column. It should be so located, however, that the building column does not offer any objectionable interference to the swing of the arm. If the floor is of concrete,

the base should be grouted in. If the floor is of wood, wooden wedges should be packed in all around the base. In both cases the machine should be bolted to the floor, either with expansion bolts or bolts going through to the ceiling of the floor beneath.

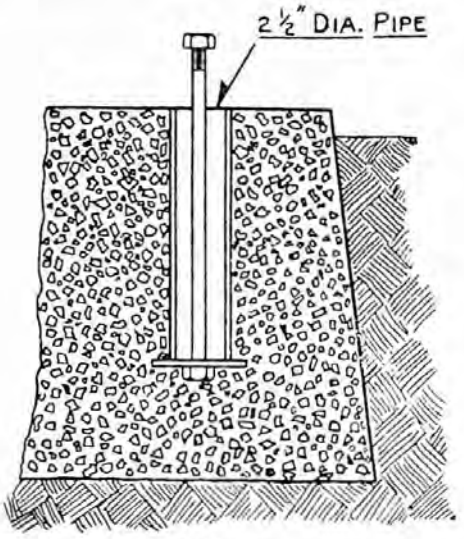


Fig. 2

Leveling

For the leveling operation, the most accurate level obtainable should be used. We recommend a level, 18" to 20" in length, having a bubble several inches long and a graduated glass tube. The ordinary machinist's level is not sufficiently accurate for high grade results and should only be used where nothing better is available.

A dozen steel wedges, 2" wide and 8" long, tapering from 1/16" to 1" in thickness should also be provided. After the machine has been set in place on the foundation, a wedge should be inserted at each of the points indicated by arrows that are painted on the base. Make certain that the machine is resting only on these wedges and is not touching the foundation at any point. If the top of the foundation is uneven, put steel plates under the wedges.

Clean the top of the base thoroughly and remove any burrs or nicks that might have been received in transit. Care must also be taken to insure that there is no grit on the finished surface of the base or on the under side of the level. Grit can only be detected by rubbing these surfaces with the bare hands. Follow the instructions given in Fig. 4 and check the final readings several times to be sure that they are within the limits.

The remaining wedges should be used for packing. Place them so that the base will be evenly supported on all sides. These packing wedges must be lightly and carefully driven. They must be tight enough to insure a good bearing between the base and the foundation, but not so tight as to loosen the wedges that were used for leveling and thereby disturb the level of the machine. When all wedges are in place, make a final check of the leveling as outlined. in the preceding paragraph. If it is correct, the machine is ready for grouting in.

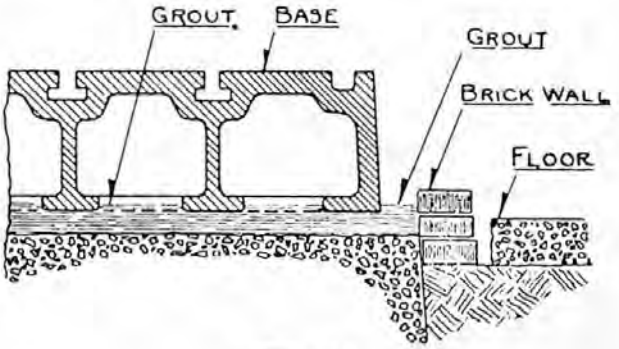
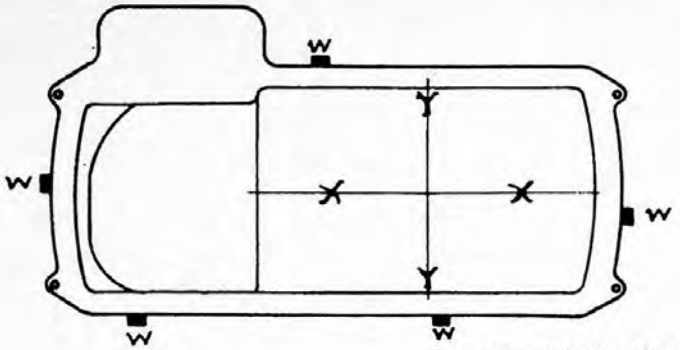


Fig. 3

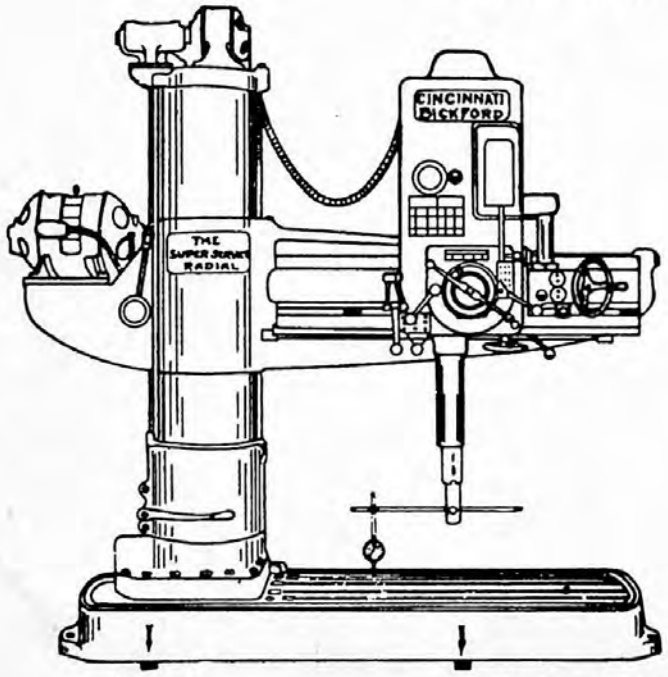
Grouting

A grout of one part sand and one part cement should be used. It should be thin enough to flow under the entire base. Good practice is to build a wall of several courses of brick around the machine, leaving a space of several inches in width between the base and the wall as shown on Fig. 3. The grout is then poured into this space to about the level shown. After it has had sufficient time to harden, the brickwork can be removed. Incidentally, the grout should not be mixed near the machine. This precaution is necessary to prevent sand and cement dust getting on the finished surfaces.

IN LEVELING YOUR SUPER SERVICE RADIAL
TRAM IT THIS WAY, BEFORE GROUTING.

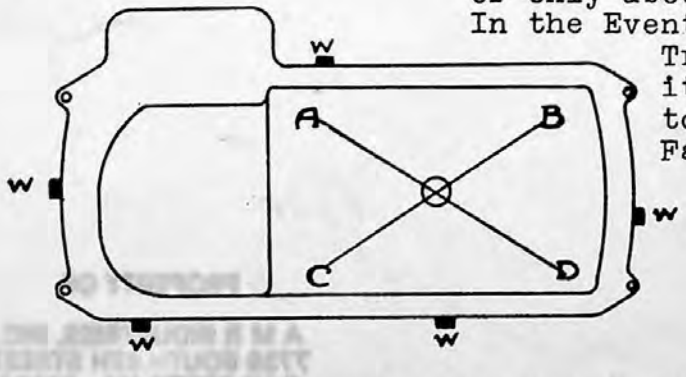


Level With Sensitive Level Along X-X & Y-Y While Supported Only on Wedges "W" at the Positions Marked With White Lines on Base.



WEDGE

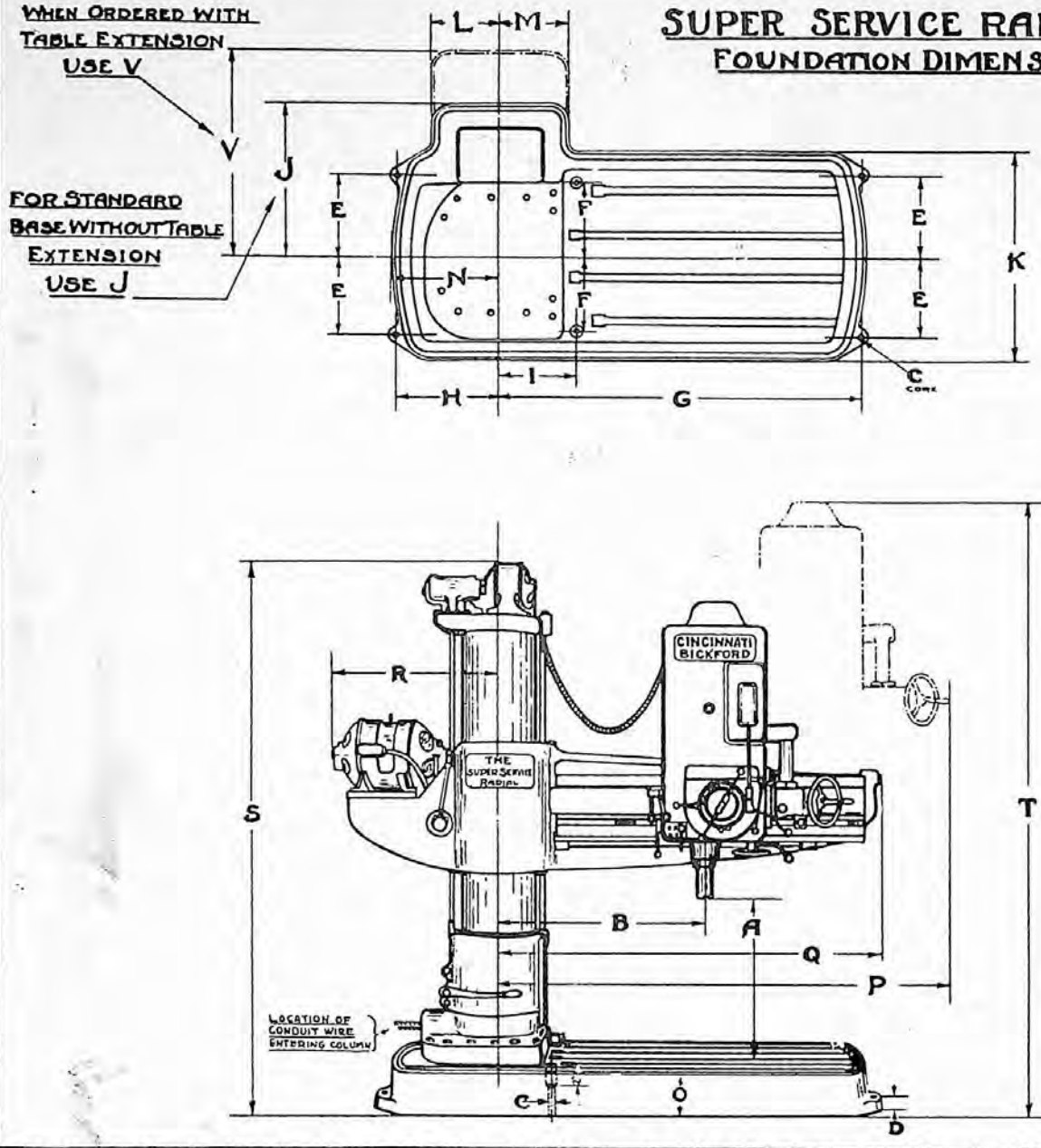
With Base Leveled Indicator in Spindle as Shown Should Read within .005" on the Four Corners of Base (an error of only about .001" per foot). In the Event the Base Does Not Tram to these Limits it will be Necessary to Re-locate Wedges to Favor the Point Showing out of Tram.



MOVING THE HEAD ALONG THE ARM AND READING INDICATOR IS NO CHECK

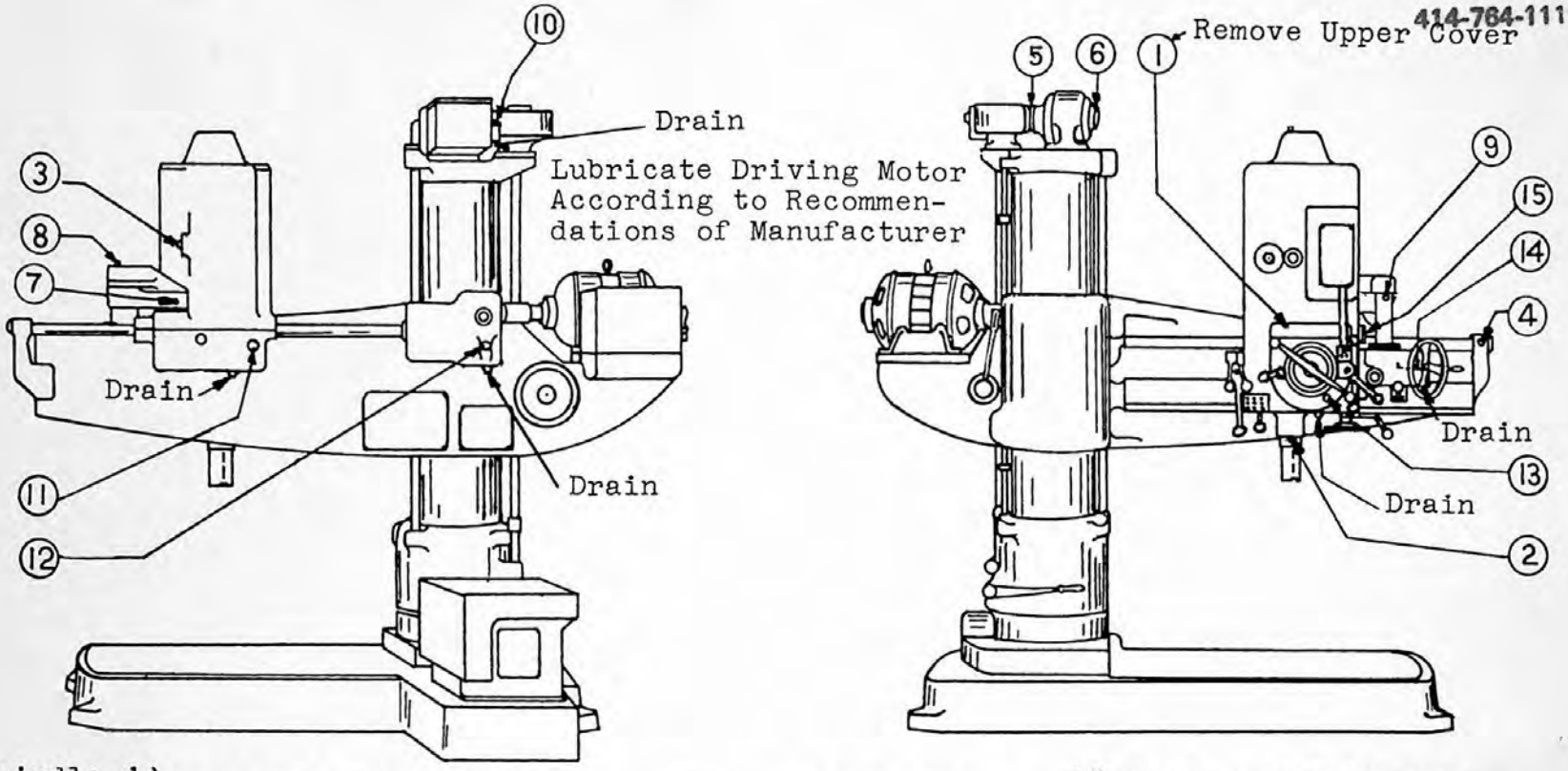
Fig. 4

SUPER SERVICE RADIALS
FOUNDATION DIMENSIONS



SIZE ARM	SIZE DIA. OF COL.	A MIN.	A MAX.	B MIN.	B MAX.	C	D	E	F	G	H	I	J	K	L	M	N	O	P HAND TRAV.	P POWER TRAV.	Q	R	S L.H.C. CLAMP	S HAND CLAMP	T MAX.	V
3 FT.	11"	14"	4'-6"	21¼"	3'-9⅛"	1"	2¾"	13¾"	11¼"	56"	19⅝"	10⅞"	26½	36	17⅜"	12⅞"	20¼	7	6'-3⅛"	6'-5⅜"	5'-5½"	3'-4"	8'-8¼"	7'-10½"	9'-9"	48⅛"
4 FT.	11"	14"	4'-6"	21¼"	4'-9⅛"	1"	2¾"	13¾"	11¼"	68"	19⅝"	10⅞"	26½	36	17⅜"	12⅞"	20¼	7	7'-3⅛"	7'-5⅜"	6'-5½"	3'-4"	8'-8¼"	7'-10½"	9'-9"	"
4 FT.	13"	13	5'-0"	21¼"	4'-9⅛"	1"	2¾"	13¾"	11¼"	68"	19⅝"	10⅞"	26½	36	17⅜"	12⅞"	20¼	7	7'-3⅛"	7'-5⅜"	6'-5½"	3'-4"	9'-3½"	8'-6"	10'-5¼"	"
5 FT.	13"	13	5'-0"	21¼	5'-9⅛"	1"	2¾"	13¾"	11¼"	80"	19⅝"	10⅞"	26½	36	17⅜"	12⅞"	20¼	7	8'-3⅛"	8'-5⅜"	7'-5½"	3'-4"	9'-3½"	8'-6"	10'-3"	"
4 FT.	15"	14	5'-6"	22"	4'-10⅛"	1⅛"	2¾"	15⅞"	14½"	63⅛"	20½"	11½"	30½	41	17⅜"	12⅞"	21¼	8	7'-4⅜"	7'-6⅝"	6'-6¾"	3'-7½"	9'-10¾"	9'-1"	11'-0¼"	48⅞"
5 FT.	15"	14	5'-6"	22"	5'-10⅜"	1⅛"	2¾"	15⅞"	14½"	75⅛"	20½"	11½"	30½	41	17⅜"	12⅞"	21¼	8	8'-4⅜"	8'-6⅝"	7'-6¾"	3'-7½"	9'-10¾"	9'-1"	11'-0¼"	"
6 FT.	15"	16	5'-6"	22"	6'-10⅜"	1⅛"	2¾"	15⅞"	14½"	87⅛"	20½"	11½"	30½	41	17⅜"	12⅞"	21¼	8	9'-4⅜"	9'-6⅝"	8'-6¾"	3'-7½"	9'-10¾"	9'-1"	10'-10"	"
5 FT.	17"	11½	6'-0"	23⅜"	5'-11⅝"	1¼"	3"	18½"	16½"	75½"	24¾"	12¾"	33	46	19¾"	14⅞"	25⅜"	9	8'-6⅜"	8'-8⅝"	7'-8⅞"	3'-8½"	10'-8½"	9'-11"	12'-1¾"	55½"
6 FT.	17"	11½	6'-0"	23⅜"	6'-11⅝"	1¼"	3"	18½"	16½"	87½"	24¾"	12¾"	33	46	19¾"	14⅞"	25⅜"	9	9'-6⅜"	9'-8⅝"	8'-8⅞"	3'-8½"	10'-8½"	9'-11"	12'-1¾"	"
7 FT.	17"	12½	6'-0"	23⅜"	7'-11⅝"	1¼"	3"	18½"	16½"	99½"	24¾"	12¾"	33	46	19¾"	14⅞"	25⅜"	9	10'-6⅜"	10'-8⅝"	9'-8⅞"	3'-8½"	10'-8½"	9'-11"	11'-11½"	"
6 FT.	19"	14	6'-6"	24⅜"	7'-1"	1¼"	3½"	20½"	19⅜"	89¾"	27¾"	14⅜"	35½	51	21¾"	16⅞"	28½	10	9'-7¾"	9'-10"	8'-10⅜"	4'-3"	11'-5"	10'-7½"	12'-7¾"	60⅞"
7 FT.	19"	14	6'-6"	24⅜"	8'-1"	1¼"	3½"	20½"	19⅜"	101¾"	27¾"	14⅜"	35½	51	21¾"	16⅞"	28½	10	10'-7¾"	10'-10"	9'-10⅜"	4'-3"	11'-5"	10'-7½"	12'-7⅞"	"
8 FT.	19"	17	6'-6"	24⅜"	9'-1"	1¼"	3½"	20½"	19⅜"	113¾"	27¾"	14⅜"	35½	51	21¾"	16⅞"	28½	10	11'-7¾"	11'-10"	10'-10⅜"	4'-3"	11'-5"	10'-7¼"	12'-6½"	"

Fig. 5



Spindle 1, 2, 3, 4, 5, 6, 7, 8, 9 — Pack With Light Grease Once Every 3 Months Use Special Grease Gun Furnished

10 — Drain and Fill Once Every 3 Months With 600 W Cylinder Oil

11, 12, 13, 14 — Drain and Fill With Medium Machine Oil Every Three Months

15 — Fill With Machine Oil Each Week

OILING CHART
THE SUPER SERVICE RADIAL DRILL
THE CINCINNATI BICKFORD TOOL CO.
Cincinnati, O., U.S.A.

Fig. 6

CLEANING and OILING

Cleaning

For cleaning the machine, kerosene is preferable to gasoline. It does not evaporate and leave dried slushing compound on finished surfaces. The kerosene must be absolutely clean. The container that is used must be thoroughly cleaned before filling. Rags, if they are obtainable, are better than waste as they leave no lint or strings.

Do not move the head until the arm has been cleaned and oiled in the following manner. Take an ordinary scrub brush and clean the rack teeth thoroughly. Clean the finished surfaces of the arm on both sides of the head, being careful to remove all dirt and grit in the corners where the head fits on the arm. Rub the bare hands over the finished surfaces of the arm to make certain that all grit has been removed. This precaution is necessary to prevent cutting and scoring of the arm. With the fingers, rub plenty of oil on all of the finished surfaces of the arm.

Refer to the oiling chart, Fig. 6. At the point marked 15, is an oil pocket that supplies oil to the gibs and all of the surfaces of the head that bear on the arm. Fill this pocket level full with a good grade of medium machine oil. Clean and oil the drive shaft that is located on the rear of the arm.

Swing the head clamping lever, Fig. 7, downward as far as it will go. The head may now be moved along the arm by means of the head moving handwheel, Fig. 7. If the head appears to move stiffly, it is because of the newness. This will ease up after the machine has been in use a short time. Do not loosen the head gibs to obtain a free movement.

Clean the spindle nose and sleeve as follows: Push the quick return levers, Fig. 7, toward the head and move the spindle downward as far as it will go. Do not raise the spindle as this will draw dirt and slushing into the spindle bearing in the head.

Clean thoroughly. Clean the rack teeth with a scrub brush. There is a metal-to-metal fit between the teeth of the rack and its pinion. Any dirt or slushing will interfere with the movement of the spindle. Oil the surface of the sleeve and the rack thoroughly. The spindle may now be moved either up or down.

Clean the elevating screw with a scrub brush and oil thoroughly. Be sure that all dirt and slushing is removed. Clean the column, above and below the arm. Clean thoroughly where the arm meets the finished surface of the column. Rub with the bare hands to make sure that all grit has been removed and oil thoroughly.

Oiling

The machine as received by you, has been completely drained of all oil. Before any attempt is made to run it -- before any motor connections are made -- every detail of the following oiling instructions must be complied with.

Refer to the oiling chart, Fig. 6

Items 1 to 9, inclusive, are lubricated with a heavy fibre base or non-fluid grease. These bearings have been liberally greased before the machine was shipped and will require additional grease after each 3 or 4 months of use. A special grease gun is furnished with the machine for this purpose.

Items 1 and 2 are the upper and lower spindle bearings respectively. These are, perhaps, the most important bearings on the machine. The upper bearing is reached through a removable cover plate located on the front of the head and above the quick-return levers. Remove the brass plug in the spindle sleeve and give this bearing one-fourth of the contents of the grease gun at each oiling. To oil the lower spindle bearing, move the spindle downward to its lowest position and remove the brass plug in the lower part of the spindle sleeve. Give this bearing one-fourth the contents of the grease gun at each oiling.

Item 3 is the spindle counterbalance. This should receive several turns of the grease gun. Item 4 is the arm shaft outer bearing. Fill until clean grease shows on the arm shaft.

Items 5 and 6 are the bearings of the electric clamping motor. These bearings must receive sufficient grease, but not so much that it will get on the motor windings.

Items 7, 8 and 9 are bearings of the power rapid traverse unit. These should be liberally greased at each oiling.

Item 10 is the case that contains the worm and segment of the electric column clamp. Before starting, remove the filler plugs and fill with heavy cylinder

oil. Drain yearly and fill with fresh oil.

Items 11 to 14 inclusive, are reservoirs for the mechanism that runs in oil. Before starting, remove the filler plugs and fill with a good grade of medium machine oil. Drain each reservoir every three months and fill with fresh oil. Check the oil levels once each month and replace any shortage.

Item 11 is the reservoir that supplies oil to the driving clutches and the entire speed and feed mechanism in the head. In the bottom of this reservoir is a high pressure oil pump that forces oil to the top of the head. From this point the oil cascades down through the gears and bearings and drains back to the reservoir. This oil pump is completely submerged and never loses its priming. The driving clutches are also located in this reservoir. They run in oil.

A sight feed glass on the front of the head indicates the oil flow. This should show, when the spindle is running, an oil stream about 1/8" in diameter. Oil will not appear in the sight feed glass when the spindle is stationary because the pump only runs when the spindle revolves. A Purolator Oil Filter is connected to the oil line on the discharge side of the pump. This filter should be renewed once in every two to three years. A pressure relief valve is also located in the oil line. If, at any time, the oil stream in the sight feed glass should show signs of diminishing, the oil flow can be increased by tightening the adjusting screw on the pressure relief valve.

Item 12 is the case that contains the motor reduction gears and the elevating mechanism.

Item 13 is the reservoir in the lower part of the head that oils the feed worm and worm wheel.

Item 14 is the power rapid traverse case.

Item 15 is the reservoir that supplies oil to the gibs and all surfaces of the head that bear on the arm. This oil works out of the head and onto the arm ways, covering them with an oil film. This reservoir must be filled every week with a good grade of medium machine oil. The driving motor should be oiled in accordance with instructions furnished by the motor manufacturer.

Note: Where the machine is run continuously on day and night shifts, it must be oiled twice as often as indicated on the above schedule.

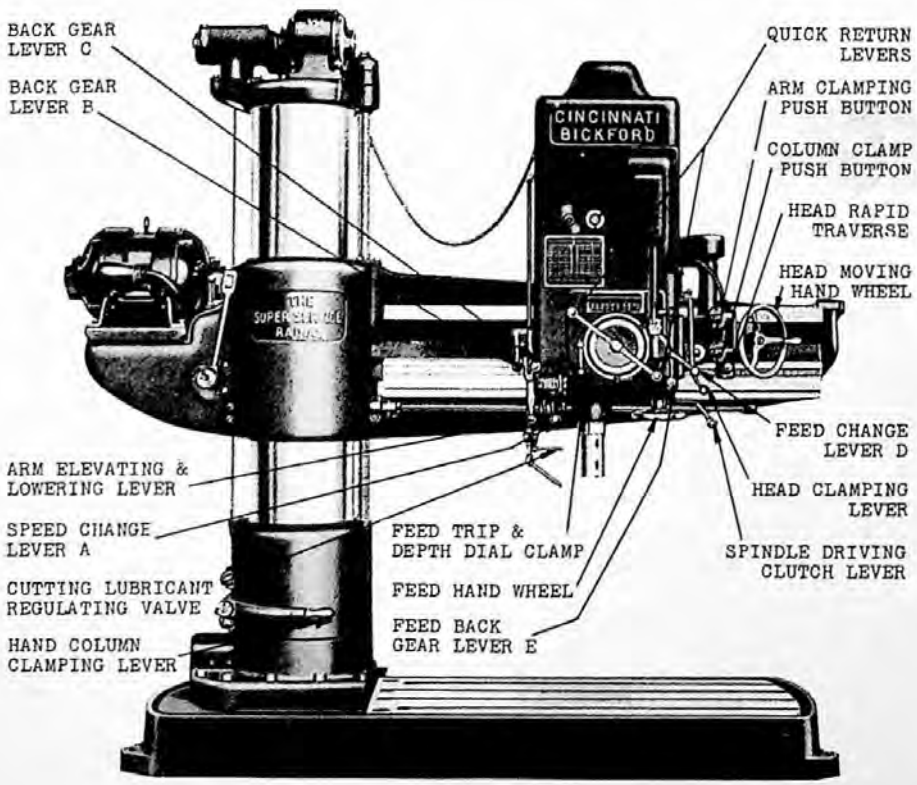


Fig. 7