

1014-5.

"AMERICAN"

SUPER

HOLE WIZARD



THE

NEWEST

NEW RADIAL

BUILT WITH 3, 4, 5 AND 6-FOOT ARMS
11-INCH DIAMETER COLUMN

Page 5

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HIGHER SPEEDS

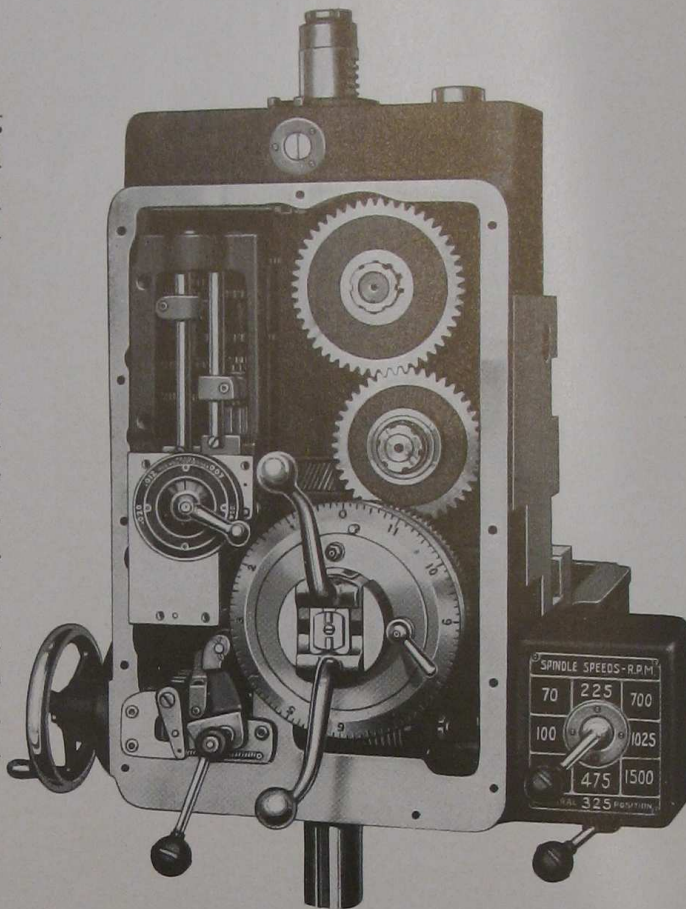
Higher speeds—lower drilling costs—less operating effort and minimized maintenance are both the purpose and basis of the new “American” Super Hole Wizard.

ITS CAPACITY

Proportioned for and equipped with a 3 horse power, built-in motor, the economical drilling capacity of this machine is approximately $1\frac{1}{4}$ inches diameter in cast iron and $\frac{3}{4}$ -inch in steel, and the tapping capacity $1\frac{1}{4}$ -inch tap in cast iron and $\frac{3}{4}$ -inch tap in steel. Variation in metal density and hardness will naturally influence these capacities.

SPINDLE SPEEDS

Nine (9) spindle speeds in geometrical progression are provided covering a standard range of 70 to 1500 r.p.m. By the use of pick-off gears this range may be changed to suit a variety of requirements. For example, if a higher speed range be desired, a range of 100 to 2150 r.p.m. or 140 to 3000 r.p.m. can be provided.



Front of Head with cover removed

OPTIONAL RANGES

SPEED RANGE A.....	R. P. M.....	1500	1025	700	475	325	225	150	100	70
	Drill Diam.....	$\frac{7}{32}$ "	$\frac{5}{16}$ "	$\frac{7}{16}$ "	$\frac{5}{8}$ "	$1\frac{1}{16}$ "	$1\frac{3}{8}$ "	Speeds suitable for spot facing and boring		
SPEED RANGE B.....	R. P. M.....	2150	1470	1000	680	470	320	215	145	100
	Drill Diam.....	$\frac{1}{8}$ "	$\frac{7}{32}$ "	$\frac{5}{16}$ "	$\frac{7}{16}$ "	$\frac{21}{32}$ "	$\frac{31}{32}$ "	$1\frac{3}{8}$ "	Speeds for spot facing and boring	
SPEED RANGE C.....	R. P. M.....	3000	2050	1400	950	650	450	300	210	140
	Drill Diam.....	$\frac{3}{32}$ "	$\frac{5}{32}$ "	$\frac{7}{32}$ "	$\frac{11}{32}$ "	$\frac{15}{32}$ "	$\frac{11}{16}$ "	1"	$1\frac{1}{2}$ "	Facing and boring

NOTE: The drill diameters shown are based on approximately 80 ft. cutting speed.

OPTIONAL RANGES

These may all be considered standard ranges for the purchaser to choose from in order that he may select the range best suited to his work. This flexibility of speed range is an outstanding advantage offered by the "American" Super Hole Wizard.

These speed ranges are based upon the use of a 60-cycle alternating current motor. If different cycle motors are used, these ranges will vary somewhat.

The entire range of nine (9) spindle speeds is secured thru a single direct reading lever conveniently located at the lower right-hand side of the head. This outstanding simplicity of speed control, coupled with the direct reading feature, makes speed selection and setting practically instantaneous.

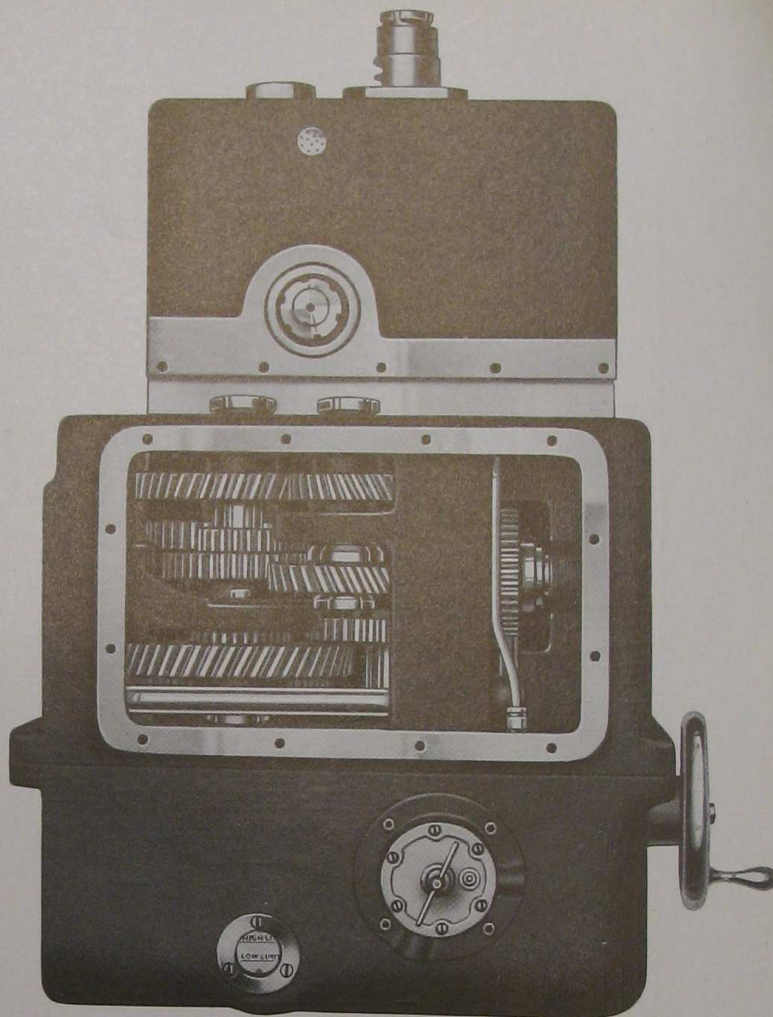


Fig. No. 1

This illustration shows the substantial construction of the main drive transmission. The entire mechanism is anti-friction mounted. All gears are hardened and ground. The slip gears are spur type with rounded teeth. The shaft connecting gears are 23° helical. The shafts are hardened with multiple splines and lands ground for highly accurate gear fits and easy shifting.

SPINDLE REVERSE FOR TAPPING

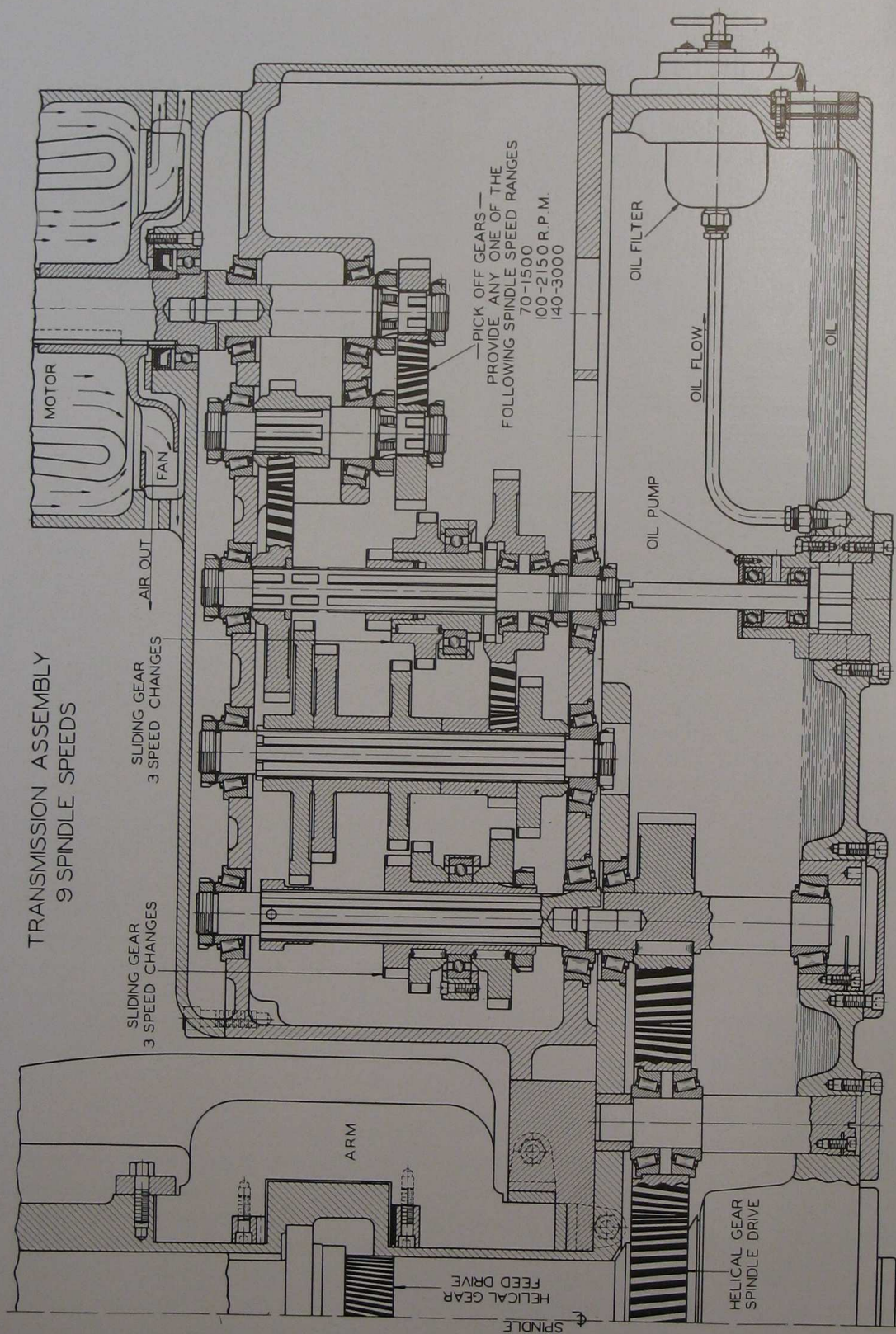
The complete elimination of the orthodox tapping attachment is a decided triumph in simplification. The spindle reverse required for tapping is accomplished by means of an almost instantaneously reversing motor. This electrical unit is guaranteed to reverse the spindle when running at the highest speed from full forward to full reverse in approximately $2\frac{1}{2}$ seconds.



Fig. No. 2
Spindle Speed and
Motor Control
Unit

START, STOP AND REVERSE

The start, stop and reverse for the spindle are secured directly thru the driving motor. A small motor control lever is located directly below the speed control lever in the most natural and convenient location for the operator, which operates a double Pilot Control Switch in conjunction with a Magnetic Reversing Switch. This entire unit is simple, dependable, foolproof and requires no adjustment.



Head transmission diagram showing mechanism for securing 9 spindle speeds

HEAD—100% ANTI-FRICTION AUTOMATICALLY OILED

The head, which is 100% anti-friction and automatically oiled by means of pump lubrication, is mounted on two large anti-friction bearings which roll on a hardened steel guideway located at the lower portion of the square type arm, which provides the narrowest possible guideway for the head mounting. Traverse along the arm is accomplished manually by means of a large hand-wheel located at the lower right-hand side of the head, one revolution of which moves the head three inches. This anti-friction design of head-mounting on the arm insures the greatest ease of movement—and a minimum amount of effort to start the head from a stationary position. All speed-changing mechanism is located within the head casting as is also the spindle feed unit, consequently both speed and feed controls are entirely from the head.

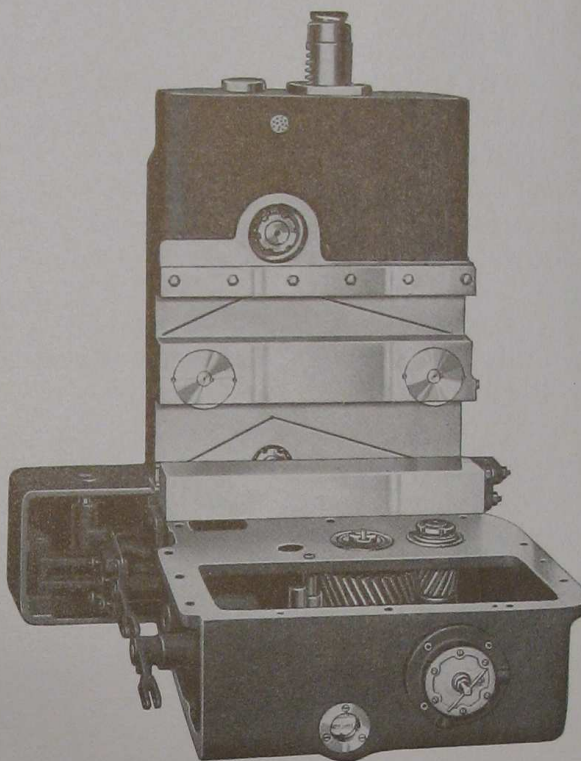


Fig. No. 1

Showing roller mounting of head on arm, the gib application, the oil level gauge, the metal oil filter and the helical gear spindle drive

The design of the head mechanism is simple and substantial. The fewest possible members are employed to produce the results desired. They are all of generous proportions and are guaranteed to possess an ample factor of safety beyond the maximum service for which the machine is designed.

All shafts are made of hardened alloy steel, with multiple splines and lands ground for highly accurate gear fits and easy shifting.

HARDENED AND GROUND GEARS

All gears in the head mechanism are made from Chrome Manganese steel forgings heat treated and oil hardened. The main drive transmission gears have ground teeth. After grinding, each gear is finish lapped under a light predetermined load in the most modern of gear-lapping machines, resulting in the smoothest and quietest gear transmission possible to produce.

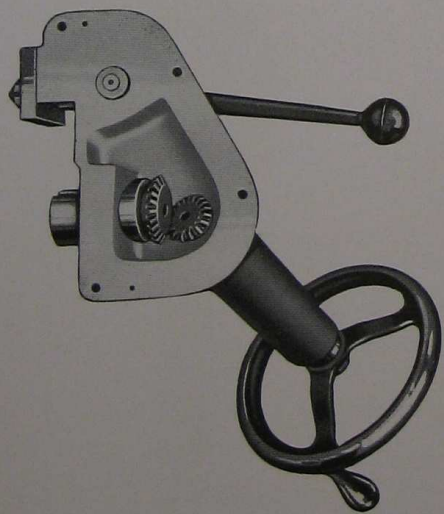


Fig. No. 2

Anti-friction head traversing unit and head clamp with actuating lever

SPINDLE AND SPINDLE SLEEVE

The construction of the spindle assembly is an outstanding achievement. The spindle is made of "NITRALLOY" steel nitrided for extreme surface hardness, thereby minimizing wear and the danger of scoring or seizing. It is ground accurately its entire length with the minimum permissible allowance for the sliding fit in the sleeve.

The spindle sleeve is also made of hardened "NITRALLOY" and honed to size. This sleeve is mounted in precision Timken roller bearings and provided with means for convenient adjustment to compensate for wear.

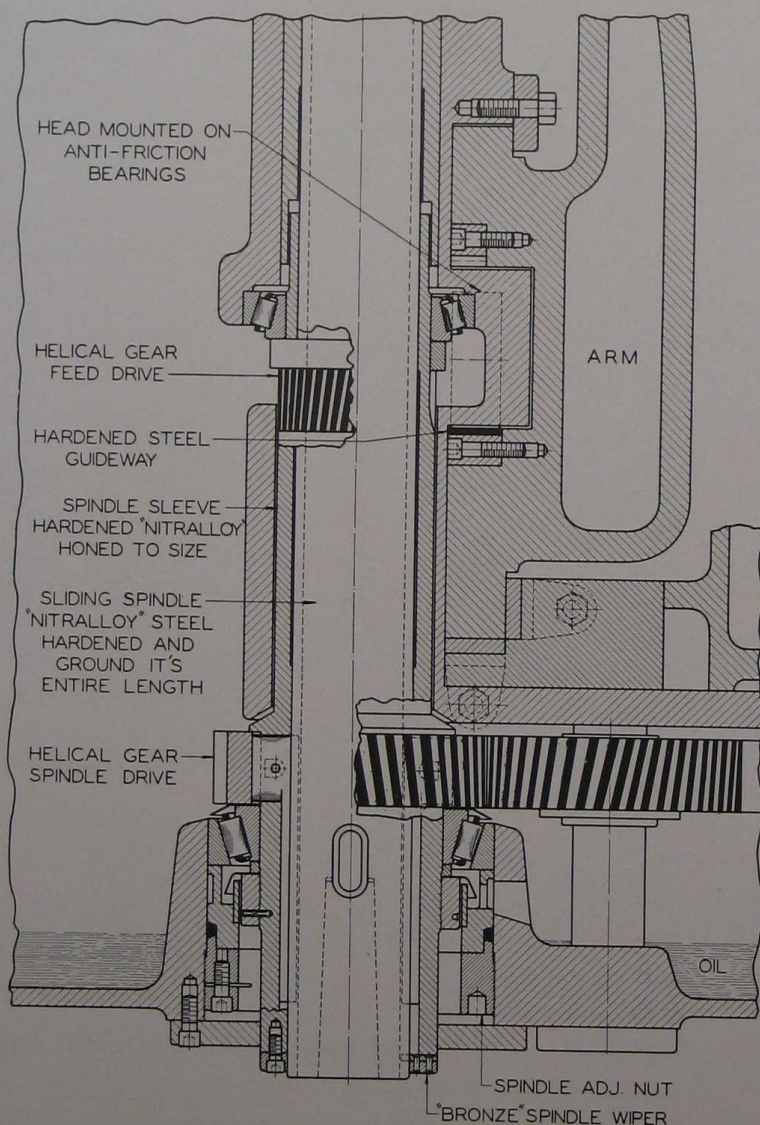


Fig. No. 2
Diagram of spindle assembly



Fig. No. 1
Spindle unit showing integral feed rack, helical gear drive and adjustable Timken roller bearing mounting.

SPINDLE DRIVE

The drive to the spindle is through hardened and ground helical gears insuring a smooth, vibrationless power transmission. The drive occurs at the bottom of the head—the closest possible point to the work, thus minimizing the torsional or twisting effect upon the spindle and completely eliminating all tendency of the spindle to chatter under service. The principle of the lower spindle drive is well known to radial drill builders and users alike, so it is hardly necessary to discourse further upon its advantages. Suffice it to say that the lower spindle drive is a thoroughly tried construction which from years of usage has been found highly satisfactory.

AUTOMATIC OILING

The entire head mechanism is automatically oiled by a pump circulating system. The oil which is carried in the bottom of the head casting is circulated by means of a pump which forces the oil to the top of the head and transmission case through a built-in oil filter to thoroughly cleanse it. From these points the oil cascades down over the gears and bearings. The functioning of the oiling system is indicated by a flow gauge in the head casting directly in front of the operator.

POWER FEEDS

Four (4) rates of geared power feed are provided including .004", .007", .012", and .020" per revolution of the spindle. All power feeds are produced by a sliding gear feed unit in which the gears are hardened and ground and the entire unit anti-friction mounted. It is oiled automatically by the pump circulating system of the head. All feeds are direct reading, the position of the dial indicating the feed in use.

The connection between the feeding unit and the spindle is through a highly efficient band type friction, adjustable from the outside, which is also completely anti-friction mounted and provides a safety feature which protects the entire transmission against accidental or careless overloading.

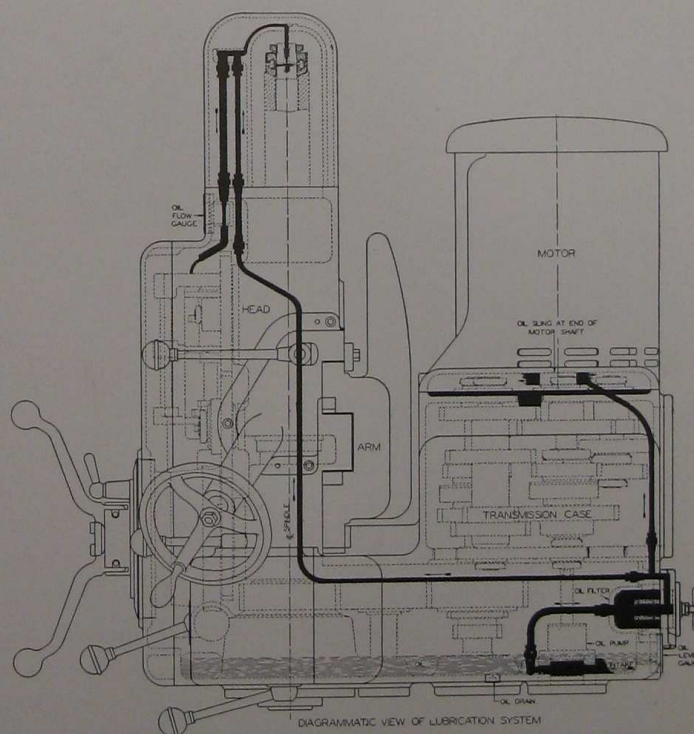


Fig. No. 1
Diagram showing automatic circulating oiling system for the entire head mechanism

HAND FEED TO SPINDLE

An exceptionally convenient hand feed unit is provided in addition to the power feed. This is actuated by means of a hand wheel located most conveniently for the operator at the left side of the head where it is entirely free from interference with any of the other operating members. This hand feed is essential for boring, spot facing and counterboring operations. A valuable safety feature is incorporated in this unit which automatically disconnects the hand wheel when the power feed is engaged, which permits the hand wheel to remain stationary when

feeding the spindle by power, thus completely eliminating the danger to the operator of a revolving wheel. This is a patented feature and a valuable one.

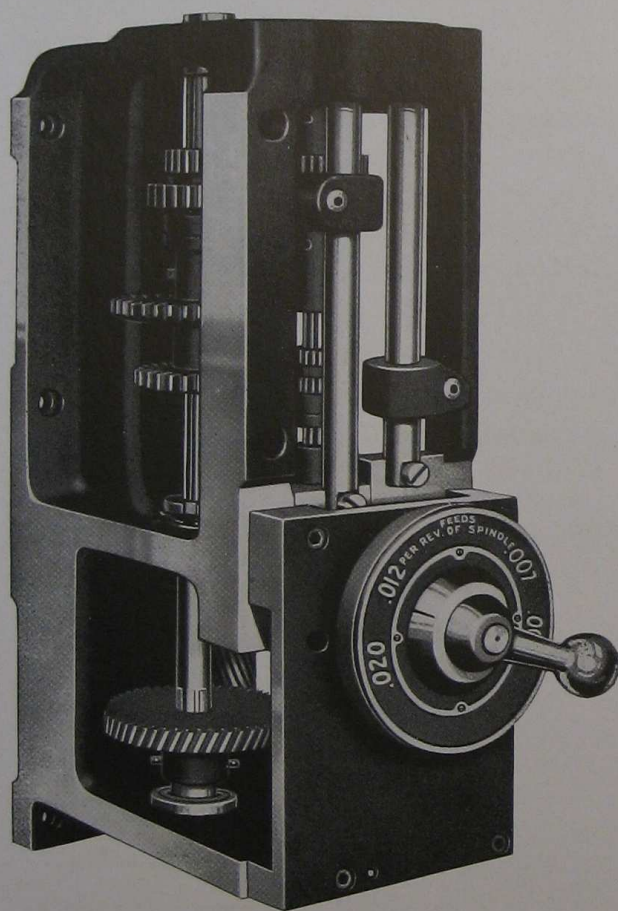


Fig. No. 1
Simple and compact slip gear feed unit—anti-friction mounted—automatically oiled, showing control lever and graduated feed index dial.

AUTOMATIC FEED TRIP

A greatly improved automatic trip for the feed has been made a feature of real operative value. It operates up to 10" at one setting—the full travel of the spindle, is positive in action and will trip accurately at the depth for which it is set. A safety stop is provided for tripping the feed at the extreme travel of spindle. All settings are made from zero and indicated on a large graduated dial which makes it very simple for the operator.

ELEVATING MECHANISM

Power elevating and lowering for the arm are provided as standard equipment. The power elevating and lowering are accomplished by means of a small $1\frac{1}{2}$ horse power ball bearing, rolled shell type motor and reversing drum neatly built into a compact unit at the rear of the arm girdle and connected

to the revolving elevating nut which operates on a stationary elevating screw. The entire unit is anti-friction mounted and runs in oil. A convenient directional control lever at the front of the arm girdle operates the elevating unit and also automatically clamps and unclamps the arm in unison with the elevating mechanism, making it impossible to raise or lower the arm while bound to the column, also preventing operation of the drill with the arm loose on the column.

ELEVATING MECHANISM

A very effective safety unit is provided in the form of an angular clutch at the top of the stationary elevating screw which automatically disengages and instantly stops the functioning of the elevating mechanism if the arm, the tool or the head is accidentally permitted to strike the work while being lowered. This is an automatic protective feature of inestimable value.

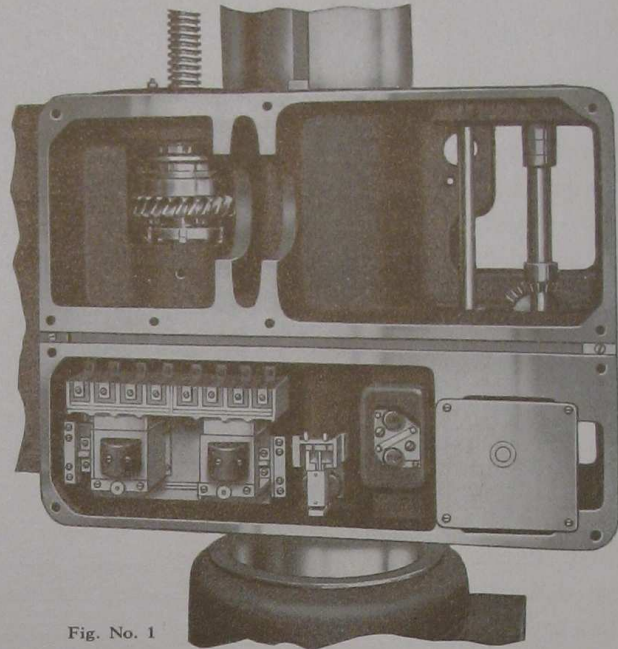


Fig. No. 1

Interior of elevating unit on back of arm showing complete housing-in of both mechanical and electrical mechanism, insuring freedom from dirt and accident.

COLUMN CLAMP

The column is easily and quickly clamped and unclamped by an impingement type of clamping mechanism controlled by a conveniently located lever at front of column operating in the vertical plane. A very short movement of this lever solidly clamps or completely loosens the column.

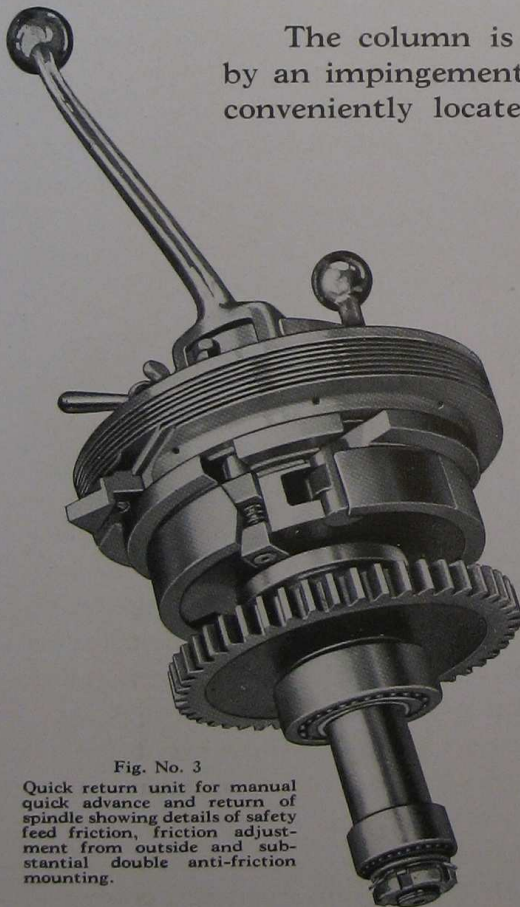


Fig. No. 3

Quick return unit for manual quick advance and return of spindle showing details of safety feed friction, friction adjustment from outside and substantial double anti-friction mounting.

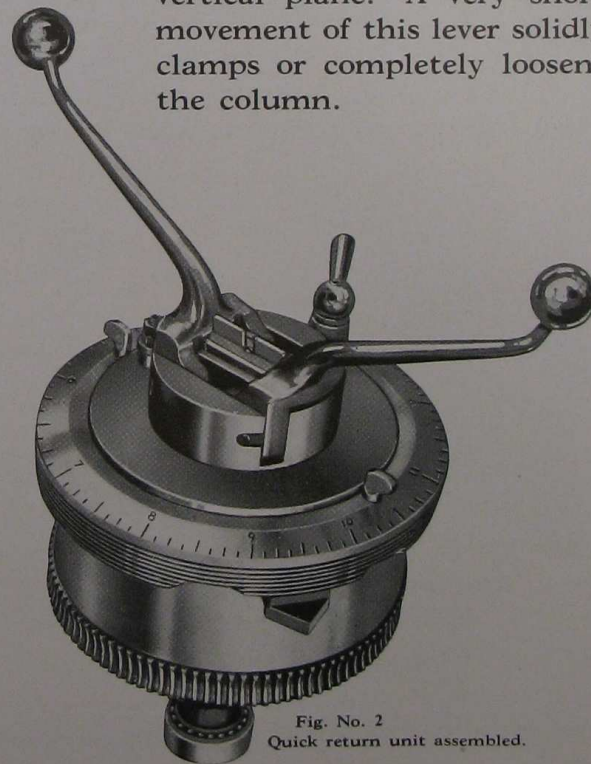


Fig. No. 2

Quick return unit assembled.

ELECTRO-TAPPER

For Faster and Better Tapping of Both Open and Blind Holes

The "American" Electro-Tapper is a semi-automatic tapping unit for application to the "American" Super Hole Wizard. It is an auxiliary tapping mechanism, furnished only on order, for high-speed tapping of duplicate open or blind holes.

The depth of the tap travel is controlled by the upper adjustable stop collar which is set to a scale for the desired depth. When that point is reached the collar contacts and trips a limit switch, instantly reversing the driving motor which in turn reverses the rotation of the spindle and backs out the tap. When the tap clears the work, the spindle continues to rotate, but ceases to feed. The operator then raises the spindle by means of the quick-return levers until the lower stop collar contacts and again trips the switch, which reverses the motor, causing the spindle to rotate again in the forward direction ready for the next hole.

The Electro-Tapper is furnished in addition to the standard manual tapping mechanism, but the two are interlocked to prevent possible conflict. Two manual control levers are incorporated in the mechanism, one marked "A" for engaging and disengaging the Electro-Tapper, and the other marked "B" for manually controlling the direction of the spindle rotation independently of the stop collars. For fast, accurate, low-cost tapping, the "American" Electro-Tapper is a marvel of efficiency.

MOTOR DRIVE

This machine is built only in the motor driven type, the cost of the electrical equipment being included in the selling price of the machine. The most

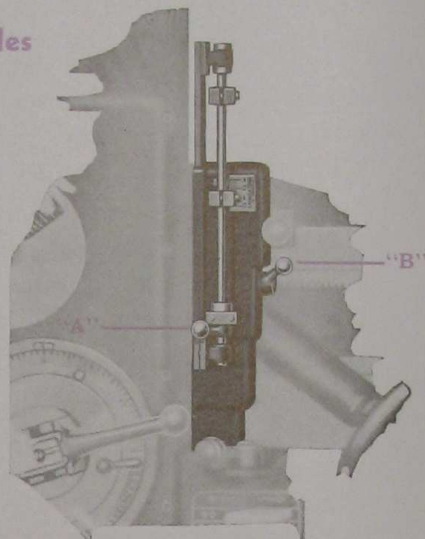


Fig. No. 1—Electro-Tapper

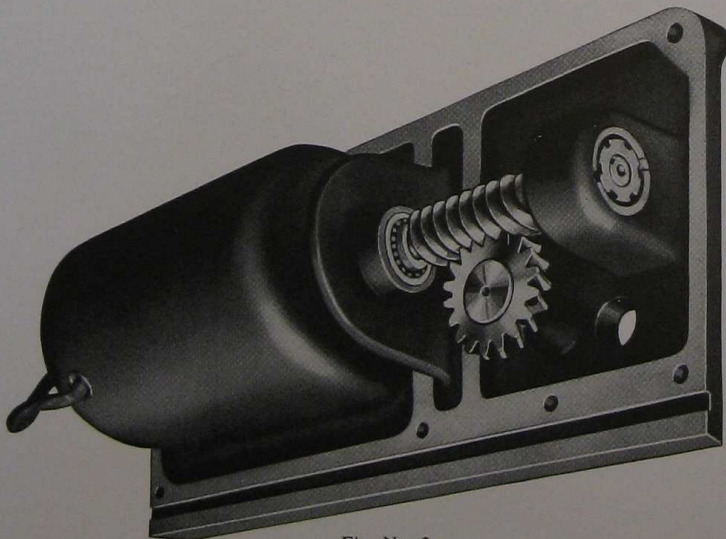


Fig. No. 2

Showing built-in 1 1/2 horse power, ball bearing, rolled shell type reversing motor and hardened and ground elevating worm with outboard support anti-friction mounted.

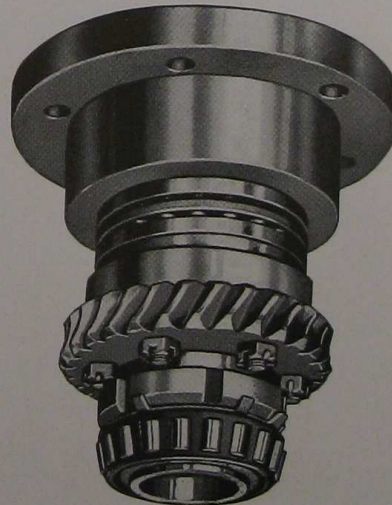


Fig. No. 3

Revolving elevating nut, anti-friction mounted, driven by hardened and ground worm and special hard worm bronze worm wheel; all automatically oiled.

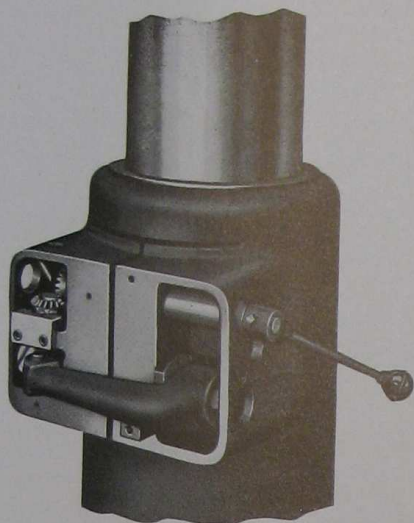


Fig. No. 1

"Finger Tip Control" Column Clamp Unit completely housed in and free from dirt and accident—may be operated with one finger.

MOTOR DRIVE

modern ball bearing, rolled shell type of 3 horse power, shaftless motor is used and is built in as an integral part of the head. Alternating Current Motors of various current characteristics are available to suit customers' electrical service. The start, stop and reverse of the motor are secured through a universally recognized high quality magnetic reversing switch operated by a lever located just below the gear shifting box most conveniently for the operator. The electrical equipment is thoroughly protected by overload and under-voltage safety features. Direct Current Motors cannot be used.

TABLES

Two styles of tables have been developed for the customer to select from in order to best accommodate his particular class of work. These tables are considered extra equipment and are furnished only on specific order.

PLAIN BOX TABLE

The plain box table, illustrated by Fig. No. 2, provides two large working surfaces, one horizontal and one vertical, both with Tee slots for clamping the work. This table is clamped to base by T-bolts, and can be quickly removed when desired.



Fig. No. 2
Plain Box Table



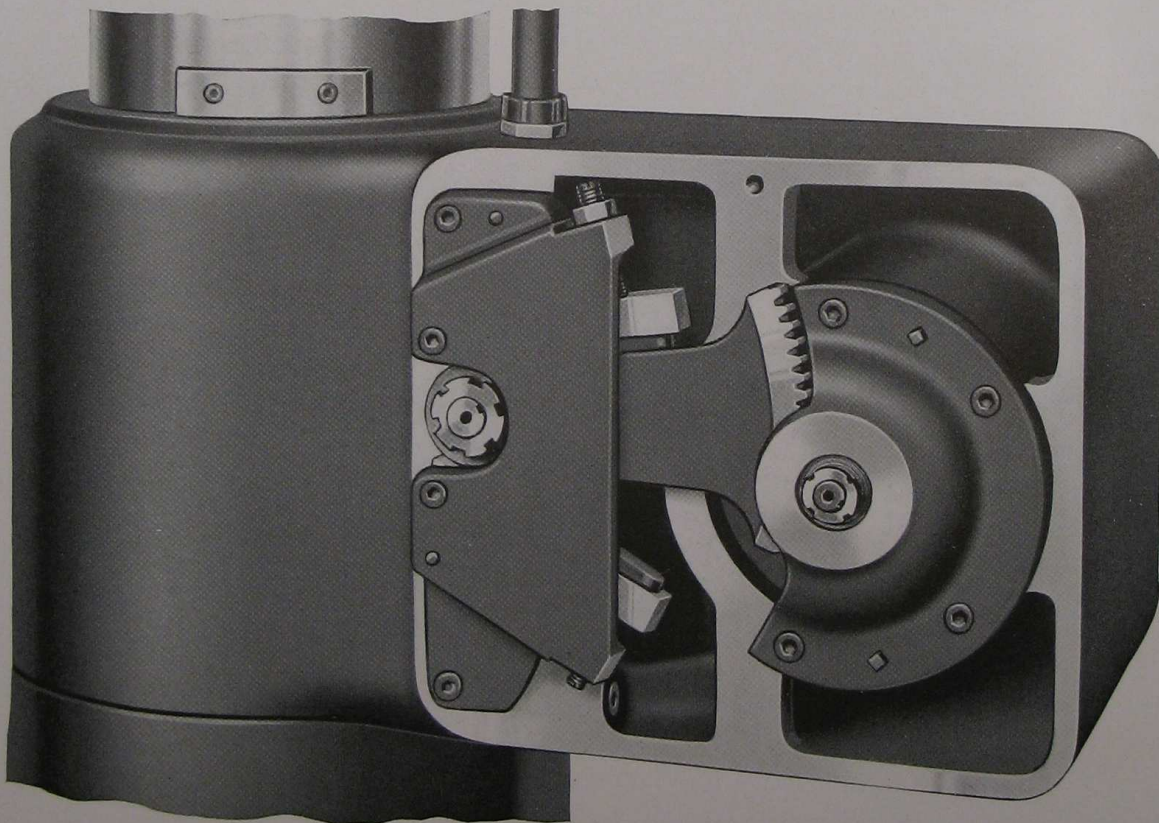
Fig. No. 3
Universal Table

UNIVERSAL TABLE

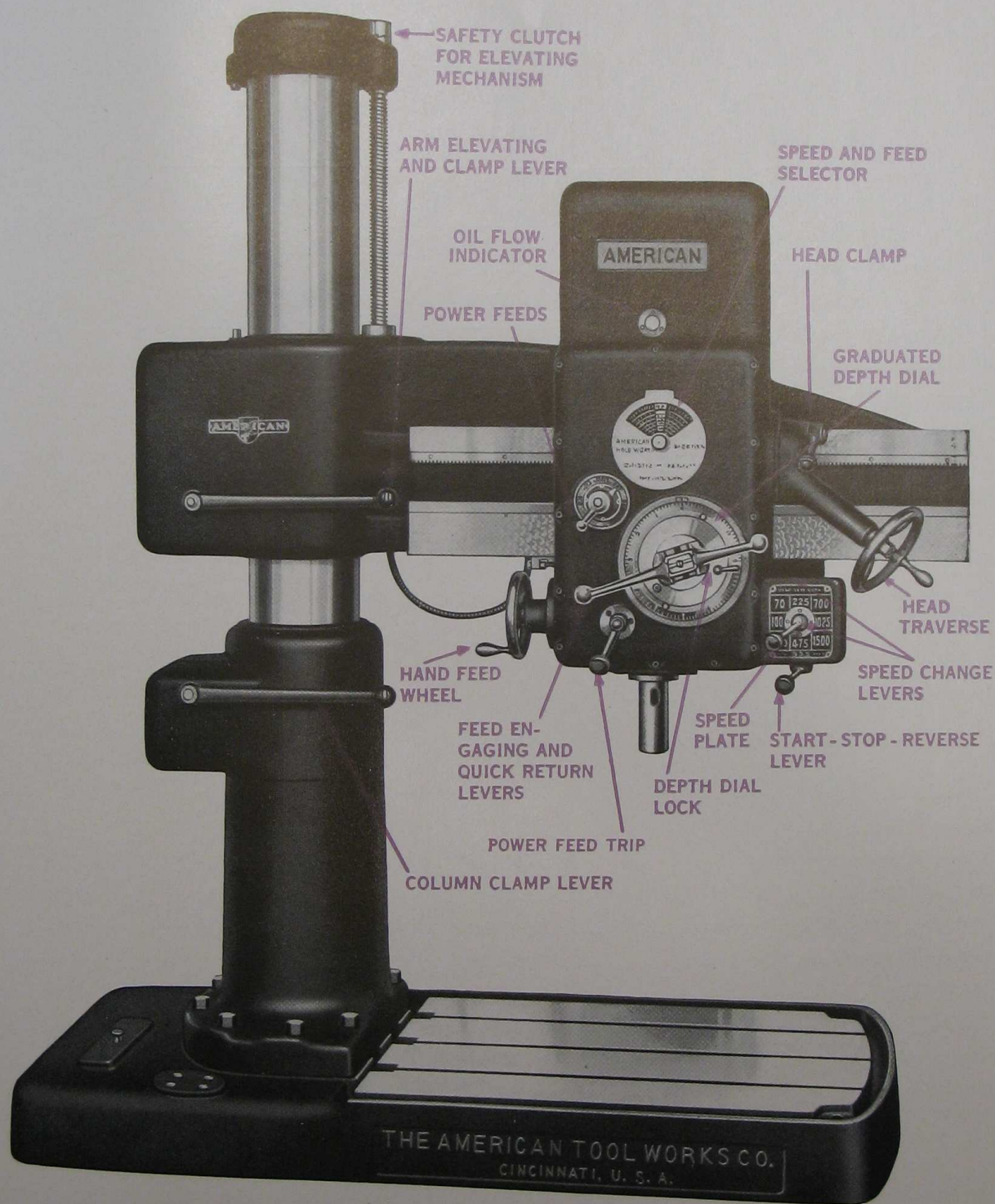
The universal table, Fig. No. 3, page 15, is used for angular work settings. It consists of a standard base, on which is mounted a tilting work table of two surfaces. Either face may be set in a vertical position by means of a segment and worm. This arrangement, together with a T-handle wrench, makes it very easy to move the table when carrying a heavy load. Working table can be securely clamped by two bolts, thereby relieving the worm and segment of undue strain, since they are self-locking in themselves. Graduations on the segment show the angle at which the table top is set. The table is located on the base in the same manner as the plain box table.

ELECTRIC COLUMN CLAMP

The electric column clamp operated from the head is offered as an extra for the Super Hole Wizard. It consists primarily of a small, built-in motor unit located at the rear of the column, which actuates the column clamping mechanism by power instead of by hand. This unit is so designed that it is absolutely dependable and foolproof and does not curtail the working surface of the base regardless of the position of the arm. Instantaneous operation of the electric clamp is effected thru an "on and off" push button located on the head.



Details of Electric Column Clamp.



SPECIFICATIONS

SIZE OF RADIAL	3-Foot	4-Foot	5-Foot	6-Foot
Drills to Center of Circle on Base or Table. . .	72"	96"	120"	144"
Maximum Distance, Spindle to Base.	55 $\frac{1}{4}$ "	55 $\frac{1}{4}$ "	55 $\frac{1}{4}$ "	55 $\frac{1}{4}$ "
Minimum Distance, Spindle to Base.	16 $\frac{3}{4}$ "	16 $\frac{3}{4}$ "	16 $\frac{3}{4}$ "	16 $\frac{3}{4}$ "
Traverse of Spindle.	10"	10"	10"	10"
Minimum Distance, Spindle to Column Stump. .	10 $\frac{3}{4}$ "	10 $\frac{3}{4}$ "	10 $\frac{3}{4}$ "	10 $\frac{3}{4}$ "
Hole in Spindle, Morse Taper Number.	4	4	4	4
Diameter of Spindle at Point of Drive.	2 $\frac{1}{2}$ "	2 $\frac{1}{2}$ "	2 $\frac{1}{2}$ "	2 $\frac{1}{2}$ "
Traverse of Head on Arm.	25 $\frac{1}{4}$ "	37 $\frac{1}{4}$ "	49 $\frac{1}{4}$ "	61 $\frac{1}{4}$ "
Traverse of Arm on Column.	28 $\frac{1}{2}$ "	28 $\frac{1}{2}$ "	28 $\frac{1}{2}$ "	28 $\frac{1}{2}$ "
Bearing of Head on Arm.	16"	16"	16"	16"
Bearing of Arm on Column.	22"	22"	22"	22"
Height of Drill Over Column.	100 $\frac{5}{16}$ "	100 $\frac{5}{16}$ "	100 $\frac{5}{16}$ "	100 $\frac{5}{16}$ "
Extreme Height of Drill Over Spindle.	101 $\frac{5}{8}$ "	101 $\frac{5}{8}$ "	101 $\frac{5}{8}$ "	101 $\frac{5}{8}$ "
Number of Power Feeds.	4	4	4	4
Range of Power Feeds.004" to .020"	.004" to .020"	.004" to .020"	.004" to .020"
Number of Spindle Speeds.	9	9	9	9
Range of Spindle Speeds—Any one of Following {	70-1500 100-2150 140-3000	70-1500 100-2150 140-3000	70-1500 100-2150 140-3000	70-1500 100-2150 140-3000
Motor, H. P.	3	3	3	3
Height of Base.	7"	7"	7"	7"
Working Surface of Base.	36" x 41"	36" x 53"	36" x 65"	36" x 77"
Radius to Clear Extreme Point of Head on Arm. .	68 $\frac{1}{2}$ "	80 $\frac{1}{2}$ "	92 $\frac{1}{2}$ "	104 $\frac{1}{2}$ "
Plain Box Table (Height Top Surface).	20"—18"x24"	20"—18"x24"	20"—18"x24"	20"—18"x24"
Universal Table (Height Top Surface).	21 $\frac{3}{4}$ "—20"x24"	21 $\frac{3}{4}$ "—20"x24"	21 $\frac{3}{4}$ "—20"x24"	21 $\frac{3}{4}$ "—20"x24"
Net Weight. lbs.	7700	8200	8700	9200
Crated Weight. lbs.	8000	8500	9000	9500
Boxed Weight. lbs.	9600	10100	10600	11100
Cubic Feet—Boxed.	210	230	250	270

