



TOOLS FOR MORTISING • BORING • ROUTING



Catalog No. 36-M

GREENLEE TOOL CO., ROCKFORD, ILLINOIS

TERMS

To GREENLEE customers having adequate ratings or with satisfactory references, terms are net cash in thirty days, or 2% cash discount 10th of month following date of invoice. If purchasers are unknown or without rating, we ask for remittance in advance or ship on basis of cash against documents.

SHIPPING

All orders are formally acknowledged and goods are carefully packed and checked. Packing lists are supplied with each shipment. Claims for shortage or errors must be made on receipt of goods. Our delivery is to the transportation company. Shipments lost or damaged in transit are not at our risk, but we will prosecute claim for same in behalf of the purchaser. If not otherwise instructed, we use our judgment in shipping orders by freight, express, or parcel post. When shipping by parcel post, we reserve the right to register or insure, charging for same in addition to postage.

GUARANTEE

We guarantee every tool bearing the GREENLEE name to be free from imperfections of material or workmanship. One of the terms of our guarantee is that tools claimed defective must be returned for our inspection.

INDEX

DESCRIPTION	PAGE NUMBER
Bit Sharpening Instructions.....	18
Boring Chart for Wood Screws.....	19
Bushings, Hollow Chisels and Bits.....	5
Carbide Router Bits.....	6
Countersinks, Adjustable and Split Shank Type	14 — 15
Countersinks, Machine Bits and Drills, Solid Type.....	13
Double Spur Machine Bits.....	8
Dowel Bits and Drills, Screw Shank	10
Drills, Taper Head and Spur Machine	11
Drills, Straight Shank for use with Countersinks.....	15
Expansive Machine Bits.....	7
Extension Lip Machine Bits.....	8 & 10
Hollow Chisels.....	1 — 4

DESCRIPTION	PAGE NUMBER
Hollow Chisel Bits.....	1 — 4
Hollow Chisel Sharpening Machine and Cutters.....	5
Hollow Chisel and Bit Instructions.....	17
Insulation Cutter Head and Bits	12
Machine Center Bits	7
Multi-Spur Machine Bits	7
Plug Cutters	12
Router Bits, Alloy and High Speed.....	6
Ship Auger Machine Bits	9
Short Extension Lip Machine Bits.....	10
Solid-Center Machine Bits.....	8
Spur Machine Drills.....	10 & 11
Teco Connector Cutter Heads.....	16



REGULAR and HARD-WEAR HOLLOW CHISELS and HOLLOW CHISEL BITS



No. 101-B 4" BLADE REGULAR HOLLOW CHISEL



No. 101-H 4" BLADE HARD-WEAR HOLLOW CHISEL



No. 101-B REINFORCED HOLLOW CHISEL



No. 101-M 4" BLADE TH'D SHANK HOLLOW CHISEL



No. 120-B REGULAR HOLLOW CHISEL BIT



No. 120-H HARD-WEAR HOLLOW CHISEL BIT



No. 120-T SINGLE-TWIST HOLLOW CHISEL BIT



No. 101-B Regular Hollow Chisels and No. 101-H Hard-Wear Hollow Chisels, square type, are for making square mortises with one stroke, and oblong mortises with each succeeding stroke, when used with the Hollow Chisel Bits illustrated above and described in the right-hand column.

These chisels have a 4" blade and are 5-1/2" over all. Sizes 1/4" and 5/16" have reinforced blades. They can be used in any mortising machine or in attachments to a machine that will take the shank sizes listed. *Made of high-grade alloy steel, heat-treated for strenuous use in high-production machines of the type employed in the woodworking industry.*

The No. 101-B Hollow Chisels have an opening on one side only, and are more suitable for use in soft woods. No. 101-H Hard-Wear type are better for hard woods where more severe chip clearance is encountered. These have openings on opposite sides which overlap in the center.

No. 101-M Threaded Shank Hollow Chisel for W. & M. Machine is carried in stock in the 3/4" square x 4" blade only.

GREENLEE No. 120-B Regular Hollow Chisel Bits, No. 120-H Hard-Wear Hollow Chisel Bits, and three sizes of No. 120-T Single-Twist Hollow Chisel Bits, *made of tough alloy steel*, are for use with the No. 101-B and No. 101-H Hollow Chisels illustrated above and described in the left-hand column.

The 1/4" and 5/16" sizes have a 3-1/4" twist length, and the other sizes a 6" twist length. All of them are 9" over-all.

The No. 120-B Regular Hollow Chisel Bits, with knife-edged spurs and without point, are more suitable for soft woods, where cutting and chip clearance are not too difficult.

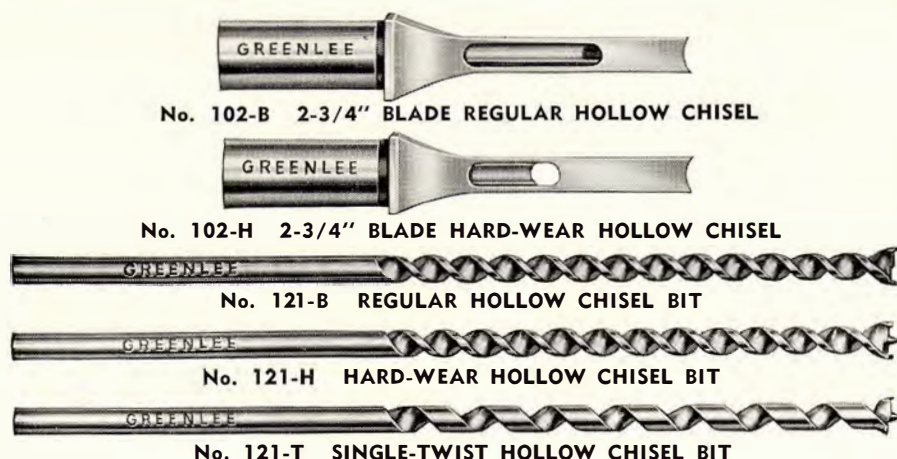
The No. 120-H Hard-Wear Hollow Chisel Bits, with broad-faced spurs and point, are for use on very hard wood, such as maple, birch, hickory, and ash. The No. 120-T Single-Twist Hollow Chisel Bits are made in 1/4", 5/16", and 3/8" sizes only, and provide rapid chip clearance when used in fast-feed machines, since chips are elevated twice as fast. Single twist has greater rigidity for more strength than double twist.

The proper bits for each chisel size are given opposite the chisel specification.

CHISELS			
Size	No.	Shank	Mortise Depth
1/4"	101-B	5/8" x 1-1/2"	1-7/8"
5/16"	101-B	5/8" x 1-1/2"	1-7/8"
3/8"	101-B, 101-H	5/8" x 1-1/2"	3-1/4"
7/16"	101-B, 101-H	5/8" x 1-1/2"	3-1/4"
1/2"	101-B, 101-H	5/8" x 1-1/2"	3-1/4"
9/16"	101-B, 101-H	3/4" x 1-1/2"	3-1/4"
5/8"	101-B, 101-H	3/4" x 1-1/2"	3-1/4"
5/8"	101-C	7/8" x 1-1/2"	3-1/4"
11/16"	101-B	3/4" x 1-1/2"	3-1/4"
3/4"	101-B, 101-H	1-1/8" x 1-1/2"	3"
3/4"	101-C	7/8" x 1-1/2"	3"
3/4"	101-M	1-3/16" x 2" (th'ded)	3"
13/16"	101-B	1-1/8" x 1-1/2"	3"
7/8"	101-B, 101-H	1-1/8" x 1-1/2"	3"
1"	101-B	1-3/8" x 1-1/2"	3"

BITS		
Size	No.	Shank
1/4"	120-B, 120-H, 120-T	3/16" x 5-3/4"
5/16"	120-B, 120-H, 120-T	1/4" x 5-3/4"
3/8"	120-B, 120-H, 120-T	19/64" x 3"
7/16"	120-B, 120-H	19/64" x 3"
1/2"	120-B, 120-H	19/64" x 3"
9/16"	120-B, 120-H	19/64" x 3"
5/8"	120-B	19/64" or 1/2" x 3"
5/8"	120-H	1/2" x 3"
11/16"	120-B	19/64" or 1/2" x 3"
3/4"	120-B	19/64" or 1/2" x 3"
3/4"	120-H	1/2" x 3"
13/16"	120-B	1/2" x 3"
7/8"	120-B, 120-H	1/2" x 3"
1"	120-B	1/2" x 3"

To use GREENLEE Hollow Chisels with round shanks 7/8" diameter and smaller, in 1-3/16" threaded sockets, use No. 114 W & M Bushing shown on page 5.



No. 102-B Regular Hollow Chisels and No. 102-H Hard-Wear Hollow Chisels are identical to the No. 101-B and No. 101-H types, except that the blade length is 2-3/4" and the over-all length 4-1/4". The shorter blade provides increased stiffness. These chisels are made of tough alloy steel in 1/4", 5/16", and 3/8" sizes only.

The No. 121-B Regular Hollow Chisel Bits and No. 121-H Hard-Wear Hollow Chisel Bits are for use with the Hollow Chisels described at the left. The No. 121-B has knife-edged spurs and no point for soft wood. The No. 121-H has broad-faced, chisel-type spurs, and brad point for hard wood. The No. 121-T Single-Twist Bits are recommended where chip clearance difficulties are encountered. Twist length, 4-3/4", over-all length, 8". Made of tough alloy steel.

The proper bits for each chisel size are given opposite the chisel specification.

CHISELS				BITS		
Size	No.	Shank	Mortise Depth	Size	No.	Shank
1/4"	102-B, 102-H	5/8" x 1-1/2"	1-7/8"	1/4"	121-B, 121-H, 121-T	3/16" x 3-1/4"
5/16"	102-B, 102-H	5/8" x 1-1/2"	1-7/8"	5/16"	121-B, 121-H, 121-T	1/4" x 3-1/4"
3/8"	102-B, 102-H	5/8" x 1-1/2"	1-7/8"	3/8"	121-B, 121-H, 121-T	19/64" x 3-1/4"



No. 103-B Regular and No. 103-H Hard-Wear Hollow Chisels have 5" blades for deeper mortising, but are otherwise similar to the 4" chisels. The No. 103-B Chisel is recommended for soft woods . . . the No. 103-H, up to and including 1", for hard woods. Chip clearance difficulties are seldom encountered in the 1-1/8" and 1-1/4" sizes. Over-all length, 6-1/2". Made of tough alloy steel.

No. 122-B and No. 122-H Hollow Chisel Bits made of tough alloy steel are available in sizes up to 1" as listed below. Only the No. 122-B is available in 1-1/8" and 1-1/4" sizes. For soft woods, the No. 122-B is recommended. For mortising hard woods, such as hard maple, birch, hickory, and ash in sizes 1-inch and under, the No. 122-H is recommended. Twist length, 7", over-all length, 10".

The proper bits for each chisel size are given opposite the chisel specification.

CHISELS				BITS		
Size	No.	Shank	Mortise Depth	Size	No.	Shank
3/8"	103-B, 103-H	5/8" x 1-1/2"	4-1/4"	3/8"	122-B, 122-H	19/64" x 3"
7/16"	103-B, 103-H	5/8" x 1-1/2"	4-1/4"	7/16"	122-B, 122-H	19/64" x 3"
1/2"	103-B, 103-H	5/8" x 1-1/2"	4-1/4"	1/2"	122-B, 122-H	19/64" x 3"
9/16"	103-B	3/4" x 1-1/2"	4-1/4"	9/16"	122-B	19/64" x 3"
5/8"	103-B, 103-H	3/4" x 1-1/2"	4-1/4"	5/8"	122-B	19/64" or 1/2" x 3"
				5/8"	122-H	1/2" x 3"
3/4"	103-B, 103-H	1-1/8" x 1-1/2"	3-3/4"	3/4"	122-B	19/64" or 1/2" x 3"
				3/4"	122-H	1/2" x 3"
7/8"	103-B, 103-H	1-3/8" x 1-1/2"	3-3/4"	7/8"	122-B, 122-H	1/2" x 3"
1"	103-B, 103-H	1-3/8" x 1-1/2"	3-3/4"	1"	122-B, 122-H	1/2" x 3"
1-1/8"	103-B	1-3/8" x 1-1/2"	3-3/4"	1-1/8"	122-B	1/2" x 3"
1-1/4"	103-B	1-3/8" x 1-1/2"	3-3/4"	1-1/4"	122-B	1/2" x 3"



No. 100-B OBLONG BAR HOLLOW CHISELS



No. 100-B OBLONG BAR HOLLOW CHISEL



No. 120-B REGULAR HOLLOW CHISEL BIT

Designed for sash and door manufacturers to make extremely oblong mortises for inserting muntin bars. They permit mortising in the sizes listed below with one stroke of the machine. *Made of finest alloy steel, scientifically heat-treated, for use in high-production machines.* Over-all length, 5-1/2".

The No. 120-B Hollow Chisel Bit as illustrated above is recommended for use in the No. 100-B Chisel. The knife-edge spurs and absence of point makes it an efficient tool for the softer woods used in the sash and door industry. Over-all length, 9". Twist length, 6". *Made of tough alloy steel.*

CHISELS

Size	No.	Shank
3/8" x 9/16" x 4"	100-B	5/8" x 1-1/2"
3/8" x 5/8" x 4"	100-B	5/8" x 1-1/2"
3/8" x 3/4" x 4"	100-B	3/4" x 1-1/2"
3/8" x 13/16" x 4"	100-B	3/4" x 1-1/2"

BITS

Sizes	No.	Shank
1/2"	120-B	19/64" x 3"
1/2"	120-B	19/64" x 3"
5/8"	120-B	19/64", or 1/2" x 3"
5/8" or 11/16"	120-B	19/64", or 1/2" x 3"

The proper bits for each chisel size are given opposite the chisel specification.

No. 101-B OBLONG HOLLOW CHISELS



No. 101-B OBLONG HOLLOW CHISEL



No. 120-B REGULAR HOLLOW CHISEL BIT



No. 120-H HARD-WEAR HOLLOW CHISEL BIT



No. 120-T SINGLE-TWIST HOLLOW CHISEL BIT

No. 101-B Oblong Hollow Chisels with 4-inch blades are designed especially for sash and door mortising in soft wood. They permit mortising in the sizes listed below with one stroke of the machine. Constructed of *finest high-grade alloy steel, scientifically heat-treated, for use in high production machines.* Over-all length, 5-1/2".

No. 120-B, No. 120-H, or No. 120-T Hollow Chisel Bits can be used in the No. 101-B Oblong Hollow Chisel. The No. 120-B Bit is recommended where mortising is being done in soft wood. A 7/16" Hollow Chisel Bit with a twist diameter of 5/16" is listed for use in the 3/8" x 1/2" and 3/8" x 9/16" chisels. Over-all length, 9".

The proper bits for each chisel size are given opposite the chisel specification.

CHISELS

Size	No.	Shank	Mortise Depth
5/16" x 3/8" x 4"†	101-B	5/8" x 1-1/2"	1-7/8"
3/8" x 7/16" x 4"	101-B	5/8" x 1-1/2"	3-1/4"
3/8" x 1/2" x 4"*	101-B	5/8" x 1-1/2"	3-1/4"
3/8" x 9/16" x 4"*	101-B	5/8" x 1-1/2"	3-1/4"
7/16" x 1/2" x 4"	101-B	5/8" x 1-1/2"	3-1/4"
1/2" x 5/8" x 4"	101-B	5/8" x 1-1/2"	3-1/4"
1/2" x 3/4" x 4"	101-B	5/8" x 1-1/2"	3-1/4"

BITS

Size	No.	Shank
5/16"	120-B, 120-H, 120-T	1/4" x 5-3/4"
3/8"	120-B, 120-H, 120-T	19/64" x 3"
3/8"	120-B, 120-H, 120-T	19/64" x 3"
3/8"	120-B, 120-H, 120-T	19/64" x 3"
7/16"	120-B	19/64" x 3"
1/2"	120-B, 120H	19/64" x 3"
1/2"	120-B, 120H	19/64" x 3"

*7/16" No. 120-B with 5/16" twist diameter can be used with 3/8" x 1/2" and 3/8" x 9/16" No. 101-B Chisels.

†Reinforced blade.



No. 104-B 6-1/2" BLADE REGULAR HOLLOW CHISEL



No. 123-B REGULAR HOLLOW CHISEL BIT

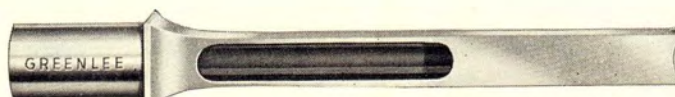
The No. 104-B-6 1/2" Blade Hollow Chisels are designed primarily for use in medium and heavy car shop machines to handle timber mortising requirements. These chisels have reinforced blades in sizes 9/16" and smaller. The larger sizes are made with straight blades. A single opening provides adequate chip clearance. *Made of high-grade alloy steel*, heat-treated, ground, and carefully sharpened. Over-all length, 8-1/2".

The Hollow Chisels listed at the left, when used in medium-sized mortisers, require the No. 123-B Hollow Chisel Bits listed below with 9" twist length and 12" overall. When using these chisels in heavy mortisers, use No. 124-B Bits with 10" twist length and 14" overall. Provided with knife-edge outlining spurs and without point for fast cutting. Carefully heat-treated and accurately sharpened for long life and smooth operation.

The proper bits for each chisel size are given opposite the chisel specification.

CHISELS				BITS			BITS		
Size	No.	Shank	Mortise Depth	Medium-Sized Mortisers			Heavy Mortisers		
3/8"	104-B*	1-1/8" x 2"	3-1/4"	3/8"	123-B	19/64" x 3"	3/8"	124-B	19/64" x 4"
7/16"	104-B*	1-1/8" x 2"	3-1/2"	7/16"	123-B	19/64" x 3"	7/16"	124-B	19/64" x 4"
1/2"	104-B*	1-1/8" x 2"	3-1/2"	1/2"	123-B	19/64" x 3"	1/2"	124-B	19/64" x 4"
9/16"	104-B*	1-1/8" x 2"	3-1/2"	9/16"	123-B	19/64" x 3"	9/16"	124-B	19/64" x 4"
5/8"	104-B	1-1/8" x 2"	5-1/8"	5/8"	123-B	1/2" x 3"	5/8"	124-B	1/2" x 4"
3/4"	104-B	1-1/8" x 2"	5-1/8"	3/4"	123-B	1/2" x 3"	3/4"	124-B	1/2" x 4"
7/8"	104-B	1-3/8" x 2"	5-1/8"	7/8"	123-B	5/8" x 3"	7/8"	124-B	5/8" x 4"
1"	104-B	1-3/8" x 2"	5-1/2"	1"	123-B	5/8" x 3"	1"	124-B	5/8" x 4"
1-1/8"	104-B	1-3/8" x 2"	5-1/2"	1-1/8"	123-B	5/8" x 3"	1-1/8"	124-B	5/8" x 4"
1-1/4"	104-B	1-3/4" x 2"	5"	1-1/4"	123-B	5/8" x 3"	1-1/4"	124-B	5/8" x 4"
1-1/2"	104-B	1-3/4" x 2"	5-1/4"	1-1/2"	123-B	5/8" x 3"	1-1/2"	124-B	5/8" x 4"
1-3/4"	104-B	2-1/4" x 2"	5"	1-3/4"	123-B	5/8" x 3"	1-3/4"	124-B	5/8" x 4"
2"	104-B	2-1/4" x 2"	5"	2"	123-B	5/8" x 3"	2"	124-B	5/8" x 4"

*Reinforced Blade



No. 105-B 8" BLADE REGULAR HOLLOW CHISEL



No. 125-B REGULAR HOLLOW CHISEL BIT

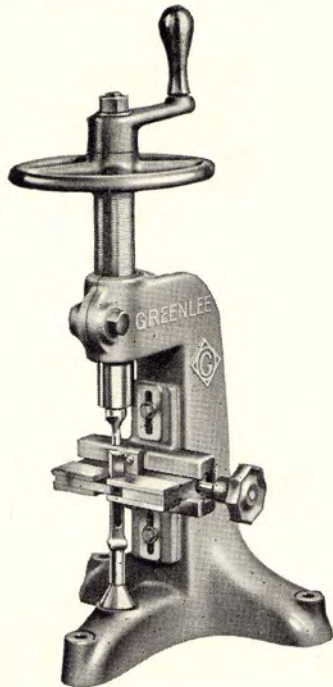
The No. 105-B-8" Blade Hollow Chisels are primarily for use in the heavy car shop mortising machines where deep mortising in the larger sizes is required. *Made of high-grade alloy steel*, carefully heat-treated and sharpened. One opening is provided for chip clearance. Over-all length, 10".

The bits listed below have an 11" twist and are 15" in length for use in larger mortisers with 8" blade chisels. When 8" blade Hollow Chisels are operated in medium mortisers, use No. 124-B Hollow Chisel Bits. *Made of tough alloy steel* and carefully heat-treated for long life.

The proper bits for each chisel size are given opposite the chisel specification.

CHISELS				BITS		
Size	No.	Shank	Mortise Depth	Size	No.	Shank
3/4"	105-B	1-1/8" x 2"	6-3/4"	3/4"	125-B	1/2" x 4"
7/8"	105-B	1-3/8" x 2"	6-3/4"	7/8"	125-B	5/8" x 4"
1"	105-B	1-3/8" x 2"	6-3/4"	1"	125-B	5/8" x 4"
1-1/8"	105-B	1-3/8" x 2"	6-3/4"	1-1/8"	125-B	5/8" x 4"
1-1/4"	105-B	1-3/4" x 2"	6-3/4"	1-1/4"	125-B	5/8" x 4"
1-1/2"	105-B	1-3/4" x 2"	6-3/4"	1-1/2"	125-B	5/8" x 4"
1-3/4"	105-B	2-1/4" x 2"	6-3/4"	1-3/4"	125-B	5/8" x 4"
2"	105-B	2-1/4" x 2"	6-3/4"	2"	125-B	5/8" x 4"

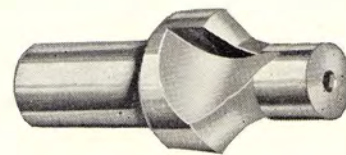
No. 720 HOLLOW CHISEL SHARPENING MACHINE



A hand-operated machine that speeds resharpener of dull chisels and can also be used for reclaiming broken chisels that might otherwise be discarded. Its use will eliminate

practically all hand filing, since it is only necessary to complete the corner grooves of the chisel with a square file. It also permits shaping the correct inside contour of the chisels for maximum cutting efficiency. Will sharpen chisels up to 1-1/4" square and 6-3/4" in over-all length. Base is 12" x 10-1/2", with holes for bolting to workbench. Height over-all, 27".

No. 111 DOUBLE-ANGLE CUTTERS



These cutters are for use in the No. 720 Hollow Chisel Sharpening Machine, and are especially designed for GREENLEE Hollow Chisels only. A separate cutter is required for each size chisel. They are easily resharpened by regrinding the face, and the contour of cutter is not changed. Made of high-speed steel.

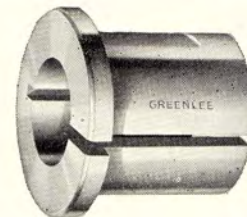
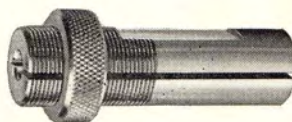
Stock cutter sizes: 1/4", 5/16", 3/8", 7/16", 1/2", 9/16", 5/8", 11/16", 3/4", 13/16", 7/8", 1", 1-1/8", and 1-1/4".

See Chisel Sharpening Instructions on Page 17 of this Catalog.

GREENLEE HOLLOW CHISEL and BIT BUSHINGS



No. 115 SPLIT BIT BUSHING



No. 114
W&M THREADED CHISEL BUSHING

No. 117 ADJUSTABLE BIT BUSHING

No. 116 SPLIT CHISEL BUSHING

Specify type of bushing, bore, and outside diameter of bushing when ordering. Bushings of special dimensions can be made to order.

No. 115 SPLIT BIT BUSHINGS

Bore	Outside Diameter	Bore	Outside Diameter
3/16"	19/64"	1/4"	5/8"
1/4"	19/64"	19/64"	5/8"
3/16"	1/2"	1/2"	5/8"
1/4"	1/2"	19/64"	3/4"
19/64"	1/2"	1/2"	3/4"
3/16"	5/8"	5/8"	3/4"

No. 117 ADJUSTABLE BIT BUSHINGS

Bore	Outside Diameter	Bore	Outside Diameter
3/16"	3/4"	1/2"	3/4"
1/4"	3/4"	5/8"	3/4"
19/64"	3/4"		

No. 116 SPLIT CHISEL BUSHINGS

Bore	Outside Diameter	Bore	Outside Diameter
5/8"	7/8"	1-3/8"	1-3/4"
3/4"	7/8"	5/8"	2"
5/8"	1-1/8"	3/4"	2"
3/4"	1-1/8"	1-1/8"	2"
5/8"	1-3/8"	1-3/8"	2"
3/4"	1-3/8"	1-3/4"	2"
1-1/8"	1-3/8"	5/8"	2-1/4"
5/8"	1-3/4"	3/4"	2-1/4"
3/4"	1-3/4"	1-1/8"	2-1/4"
1-1/8"	1-3/4"	1-3/8"	2-1/4"

No. 114 W&M THREADED CHISEL BUSHING

Bushing Bore Threaded Diameter
5/8", 3/4" and 7/8" for Chisels 3/4" and smaller 1-3/16"



GREENLEE ROUTER BITS



No. 142 ALLOY STEEL ROUTING BITS

No. 142 Right-Hand Routing Bits are carried in stock with double flutes and square cutting end. Flutes, shank, and back clearance are accurately ground to insure even cutting by both edges. *Made of tough alloy steel, carefully heat-treated.*

No. 141 Left-Hand Router Bits are stocked in sizes 3/16" to 1" inclusive; No. 142 Right-Hand Bits in 3/16" to 1-1/4" as listed.

Size	Flute Length	Shank	Size	Flute Length	Shank
3/16"	1-1/4"	1/2" x 1-1/2"	5/8"	1-1/2"	1/2" x 1-1/2"
1/4"	1-1/2"	1/2" x 1-1/2"	3/4"	1-1/2"	1/2" x 1-1/2"
5/16"	1-1/2"	1/2" x 1-1/2"	7/8"	1-1/2"	1/2" x 1-1/2"
3/8"	1-1/2"	1/2" x 1-1/2"	1"	1-1/2"	1/2" x 1-1/2"
7/16"	1-1/2"	1/2" x 1-1/2"	1-1/8"	1-1/2"	1/2" x 1-1/2"
1/2"	1-1/2"	1/2" x 1-1/2"	1-1/4"	1-1/2"	1/2" x 1-1/2"
9/16"	1-1/2"	1/2" x 1-1/2"			



No. 143 SINGLE-FLUTE ROUTER

These are right-hand routers. *Made of high-speed steel carefully heat-treated to retain a sharp cutting edge.* Single flute and shank are accurately ground to size for precision work. Stocked in the sizes listed below.

Size	Flute Length	Shank
1/8"	1/2"	1/4" x 1"
5/32"	1/2"	1/4" x 1"
3/16"	5/8"	1/4" x 1"
7/32"	3/4"	1/4" x 1"
1/4"	1"	1/4" x 1"
5/16"	1"	1/4" or 5/16" x 1"
3/8"	1"	1/4" or 3/8" x 1"



No. 146 HIGH-SPEED STEEL ROUTING BIT

Made of high-speed steel, the No. 146 Bit is ideal for working hard woods and laminated stock at fast spindle speeds. Its keen edge is little affected by heat . . . stays sharp longer. Has double flutes. Entire tool is ground to accurate size. Right-Hand only in stock. No. 145 Left-Hand Router Bits can be made special-to-order.

Size	Flute Length	Shank	Size	Flute Length	Shank
3/16"	1-1/4"	1/2" x 1-1/2"	9/16"	1-1/2"	1/2" x 1-1/2"
1/4"	1-1/2"	1/2" x 1-1/2"	5/8"	1-1/2"	1/2" x 1-1/2"
5/16"	1-1/2"	1/2" x 1-1/2"	3/4"	1-1/2"	1/2" x 1-1/2"
3/8"	1-1/2"	1/2" x 1-1/2"	7/8"	1-1/2"	1/2" x 1-1/2"
7/16"	1-1/2"	1/2" x 1-1/2"	1"	1-1/2"	1/2" x 1-1/2"
1/2"	1-1/2"	1/2" x 1-1/2"			



No. 143-D DOUBLE-END ROUTER

No. 143-D Double-End, Right-Hand Routing Bits are *made of high-speed steel, carefully heat-treated, and with both cutting ends accurately ground for size and clearance.* These single-flute cutters have a 1" long center shank. Available as listed below.

Size	Flute Length	Shank	Size	Flute Length	Shank
1/8"	1/2"	1/4" x 1"	1/4"	1"	1/4" x 1"
5/32"	1/2"	1/4" x 1"	5/16"	1"	3/8" x 1"
3/16"	5/8"	1/4" x 1"	3/8"	1"	3/8" x 1"
7/32"	3/4"	1/4" x 1"			

CARBIDE ROUTER BITS



No. 143-C SINGLE FLUTE

GREENLEE Carbide Router Bits are high grade tools . . . will out-perform high-speed or alloy steel bits when cutting harder materials. The bodies are made of heat-treated, high-speed steel which give added stiffness for better adherence with the high-quality carbide inserts. Flutes, shank and back clearance are accurately ground to insure even cutting by both edges. Right hand only. Stocked in the sizes listed.

Cutter Number	Diameter Cutting Edge	Length Cutting Edge	Shank Dia.	Shank Length
3/16 - 143-C	3/16"	1/2"	1/4"	1"
1/4 - 143-C	1/4"	3/4"	1/4"	1"



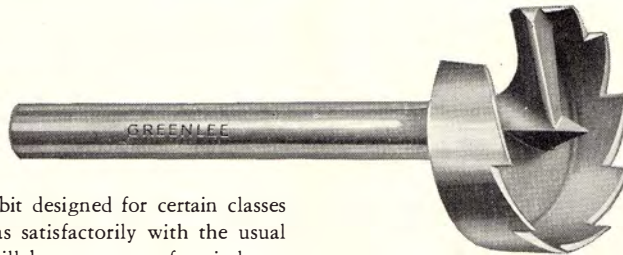
No. 146-C DOUBLE FLUTE

Cutter No.	Diameter Cutting Edges	Length Cutting Edges	Shank Diameter	Shank Length
5/16 - 146-C4	5/16"	1"	1/4"	1"
3/8 - 146-C4	3/8"	1"	1/4"	1"
5/16 - 146-C	5/16"	1"	1/2"	1-1/2"
3/8 - 146-C	3/8"	1"	1/2"	1-1/2"
3/8 - 146-CL6	3/8"	1-1/4"	1/2"	1-1/4"
1/2 - 146-C	1/2"	1-1/4"	1/2"	1-1/2"
1/2 - 146-CL	1/2"	1-1/2"	1/2"	1-1/2"
1/2 - 146-CD8	1/2"	2"	1/2"	2-1/4"
5/8 - 146-C	5/8"	1-1/4"	1/2"	1-1/2"
3/4 - 146-C	3/4"	1-1/4"	1/2"	1-1/2"

RESHARPENING—Special facilities are needed for this purpose. We suggest that you consult your local sharpening shop or return carbide bits to us for this service.



No. 149 MULTI-SPUR MACHINE BITS



A fast-cutting, smooth-boring bit designed for certain classes of boring work not handled as satisfactorily with the usual machine bits. No. 149 Bits will bore any arc of a circle on the edge of a piece of stock . . . operates equally well in hard or soft wood. They bore smoothly in veneered stock without tearing, and bore at an angle, overlapping, or on close centers without danger of splitting the stock. Due to ease of borings, larger holes can be bored with a minimum of power on small spindle machines.

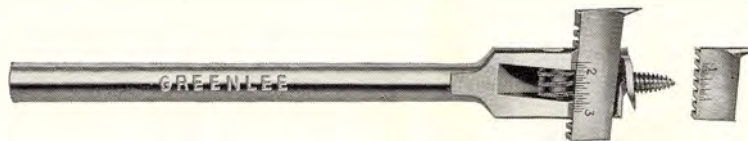
Made of *high-grade alloy steel*, the No. 149 is carefully heat-treated for long life. The head and shank are accurately ground for size and clearance. These bits operate with a minimum of friction, will not choke with chips, and can be sharpened with a file. Shanks are 1/2" diameter on 3" and smaller bits, 3/4" on larger bits. Over-all lengths range from 5-1/2" to 5-3/4". Sizes 3-1/4" and larger have double cutters and 3/8" diameter inserted point. Stock sizes as listed.

Size	Size	Size	Size
1/2"	1-1/8"	1-3/4"	2-3/4"
9/16"	1-3/16"	1-13/16"	2-7/8"
5/8"	1-1/4"	1-7/8"	3"
11/16"	1-5/16"	1-15/16"	3-1/4"
3/4"	1-3/8"	2"	3-1/2"
13/16"	1-7/16"	2-1/8"	3-3/4"
7/8"	1-1/2"	2-1/4"	4"
15/16"	1-9/16"	2-3/8"	
1"	1-5/8"	2-1/2"	
1-1/16"	1-11/16"	2-5/8"	

Shank Size 1/2"

Sizes over 3" also available with 3/4" shanks which are recommended for use if possible.

No. 6-M MACHINE EXPANSIVE BITS



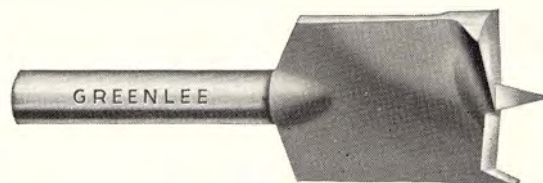
Boring holes of odd diameters is no problem with this bit . . . its two cutting blades provide a size range from 7/8" to 3", and with the extra-large blade, sizes up to 4" can be bored. Cutting blade is easily adjusted by turning a knurled screw, and locks securely in place by tightening an eccentric pin. The 1/2" shank is accurately ground concentric with

the head for true boring. Over-all length, 8". Operate this bit at slow spindle speeds. Not recommended for production runs.

No. 6-M Complete, 7/8" to 3"

No. 6-MC Cutter, 2-1/2" to 4"

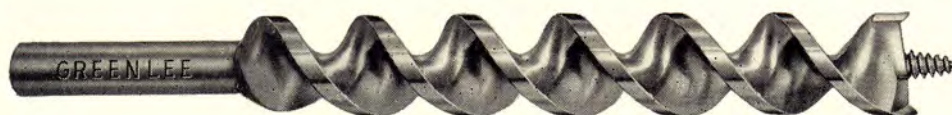
No. 169 MACHINE CENTER BITS



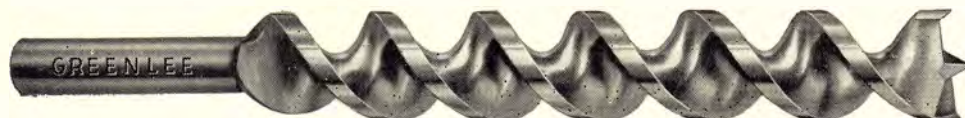
Designed primarily for boring shallow holes of large diameter, these bits have a 2" blade length, brad points, and knife-edge spurs. The shanks are 1/2" in diameter and 2-1/4" in length. Stock sizes are listed.

Size	Size	Size	Size
3/4"	1-1/4"	2"	3"
7/8"	1-3/8"	2-1/4"	3-1/4"
1"	1-1/2"	2-1/2"	3-1/2"
1-1/8"	1-3/4"	2-3/4"	4"

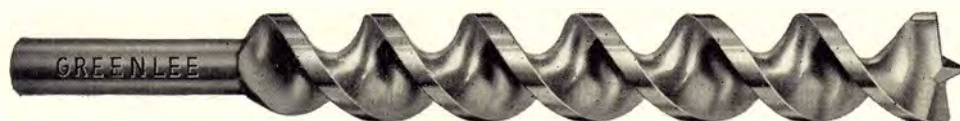
GREENLEE MACHINE BITS



No. 150 DOUBLE-SPUR MACHINE BIT — SCREW POINT



No. 150 DOUBLE-SPUR MACHINE BIT — BRAD POINT



No. 153 FLAT-CUT MACHINE BIT — BRAD POINT

The No. 150 Double-Spur Machine Bit has two outlining spurs, supported by side lips, that enable it to cut smooth holes in either soft or hard wood, cross or end grain. The double twist elevates chips out of both channels. This bit is used successfully even after the outlining spurs are worn off, although the holes are not as smooth. *Carefully made of high-grade alloy steel*, with medium-pitch screw point for general-purpose boring. Can be supplied with brad point as illustrated, *at nominal additional cost*. Price on application. *Be sure to specify point desired.*

No. 153—Same as No. 150 except without outlining spurs. This bit is especially suited for end-grain where cross-fibers

are not encountered, and hardwood. With single-thread screw point, which can be changed to brad point as illustrated *at nominal additional cost*. Price on application. *Be sure to specify point desired.*

No. 150 STOCK ASSORTMENTS

Twist Length	Shank	Sizes
4".....	1/2" x 2-1/4"	1/4" to 1-1/2" by sixteenths
6".....	1/2" x 2-1/4"	1/4" to 2" by sixteenths
12".....	1/2" x 2-1/4"	3/8" to 1-1/4" by sixteenths, also 1-3/8", 1-1/2", 1-3/4", and 2"
12".....	3/4" x 2-1/4"	
14".....	3/4" x 2-1/4"	



No. 151 EXTENSION-LIP MACHINE BIT

This bit is especially designed to do smooth boring for furniture and cabinet work. The outlining spurs sever the fibers well ahead of the extension-lip cutting edges, producing an exceptionally clean-cut hole with no tearing of the wood. The double-screw point provides a medium feed for best results. Double-twist pattern elevates chips through both

channels. A similar bit with 2-1/4" twist, 5-1/4" over all is described on page 10.

No. 151 STOCK ASSORTMENTS

Twist Length	Shank	Sizes
4".....	1/2" x 2-1/4"	1/4" to 1" by sixteenths
6".....	1/2" x 2-1/4"	1/4" to 1" by sixteenths



No. 155 SOLID-CENTER MACHINE BIT

Made with two outlining spurs, two extended cutting lips, and medium-pitch screw point. Spurs outline a smooth hole. Extension lips easily cut chips, which are elevated out of the two throats into the solid-center single spiral. Solid-center design, slightly tapered toward shank, adds greater stiffness, particularly on smaller size bits, yet provides maximum chip clearance. Regularly provided with single screw point, but this can be changed to brad point at nominal additional cost.

No. 155 STOCK ASSORTMENTS

Twist Length	Shank	Sizes
4".....	1/2" x 2-1/4"	1/4" to 1-1/4" by sixteenths
6".....	1/2" x 2-1/4"	1/4" to 1-1/4" by sixteenths
8".....	1/2" x 2-1/4"	1/4" to 1-1/4" by sixteenths
10".....	1/2" x 2-1/4"	5/16" to 1-1/8" by sixteenths
12".....	1/2" x 2-1/4"	3/8" to 1-1/4" by sixteenths
14".....	1/2" x 2-1/4"	9/16", 11/16", 13/16", 15/16", 1-1/16"



GREENLEE MACHINE BITS



No. 157 SHIP-AUGER MACHINE BIT — WITH SCREW

This tool derives its name from the fact that it is used quite extensively in the shipbuilding industry. It has one cutting edge and one side lip. The single-spiral design makes a stiff, strong tool with ample chip clearance, eliminating any tendency for the chips to crowd the bit and cause it to bind. Extremely deep holes are bored easily and quickly.

It is well-adapted for use in the portable power boring machines commonly used in ship, bridge, and framing con-

struction work. Available in 12", 18" and 24" twist lengths with 1/2" shanks in sizes as listed.



No. 157 STOCK ASSORTMENTS

Twist Length	Sizes
12".....	9/16" to 1-1/16" inclusive, by sixteenths
18".....	9/16" to 1-1/16" inclusive, by sixteenths
24".....	9/16" to 1-1/16" inclusive, by sixteenths



No. 158 SHIP-AUGER MACHINE BIT — WITHOUT SCREW

This bit has twist identical to the No. 157 Ship Auger Machine Bit except that it does not have a point and the heel is not backed-off, therefore it has less tendency to lead

off with the grain of the wood when deep boring. *These bits are not stocked, and are made to special order only.* Specify shank size desired.



No. 159 SINGLE-SPUR MACHINE BIT

Designed for boring deep, smooth holes in bridge, dock, and other heavy timber construction work. The No. 159 Bit is particularly recommended for portable electric or air-driven boring machines. The medium-pitch screw point bores twelve turns to the inch.

The polished single twist allows ample room for efficient chip clearance. Chips are carried at the center to permit easy withdrawal of the bit. The single-cutter head has one outlining spur that severs the wood fibers in advance of the

cutting edge for smoother, easier boring and long life. Available in 12", 18" and 24" twist lengths with 1/2" diameter shanks, in sizes as listed.

No. 159 STOCK ASSORTMENTS

Twist Length	Sizes
12".....	9/16" to 1-1/16" inclusive, by sixteenths
18".....	9/16" to 1-1/16" inclusive, by sixteenths
24".....	9/16" to 1-1/16" inclusive, by sixteenths





SHORT DOUBLE-TWIST EXTENSION-LIP MACHINE BITS



No. 162 SHORT EXTENSION-LIP MACHINE BITS

These bits have 2-1/4" twist lengths and are 5-1/4" over-all. They have double screw points for slow feed and are excellent for boring fine cabinet work, as well as for use in stationary or portable power equipment, or in relishing machines for boring between the tenon and the rail on window sash. The 1/2" x 2-3/4" shank bit can be used in new type relishing machines or in any single or multiple-

spindle boring machine for boring holes 2" or less in depth. The No. 161 3/8" x 2-3/4" shank bit is made for use in the old type sash and door relishing machines. Either type can be supplied with brad points at extra cost. The 3/8" shank bit can also be used in No. 195 Countersinks having 3/8" bore.

Stock sizes—1/4" thru 1" by sixteenths



SCREW-SHANK DOWEL BITS and DOWEL DRILLS



Nos. 163 and 164 SCREW SHANK DOWEL BITS

Double-twist bits with extension lip. Round shoulder has pin hole for quick removal of bit. Over-all length, 4-1/2". Made of alloy steel, and suitable for cross-grain or end-grain boring. Two shank styles as follows:

No. 163—5/16" diameter shank with No. 20 threads. Double-thread screw point.

Stock sizes: 1/4" thru 5/8" by sixteenths, also 3/4" size. Sizes 3/8", 7/16", and 1/2" also available with single-thread screw point.

No. 164—7/16" diameter shank with No. 14 threads. Single-thread screw point.

Stock sizes: 1/4" thru 5/8" by sixteenths, also 3/4" size. Sizes 3/16" thru 1/2" also available with double-thread screw point.

Be sure to specify shank diameter and threads desired.



Nos. 178 and 178-A SCREW-SHANK DOWEL DRILLS

Taper-head drill type, ideal for end-grain boring. Made of tough alloy steel, with milled twist. Easily sharpened. Round shoulder has pin hole for quick removal of bit. Over-all length, 4-1/2". In two shank styles as follows:

No. 178—5/16" diameter shank with No. 20 thread.

Stock sizes: 3/16", 1/4", 5/16", 3/8", 7/16", 1/2", 9/16", 5/8" and 3/4".

No. 178-A—7/16" diameter shank with No. 14 thread.

Stock sizes: 3/16", 1/4", 5/16", 3/8", 7/16", 1/2", 9/16", 5/8" and 3/4".

No. 178-A-HS—Made of high-speed steel with 7/16" diameter shank with No. 14 thread.

Stock sizes: 3/8", 7/16" and 1/2" in both right- and left-hand drills.



Nos. 179, 179-A and 179-M SCREW-SHANK DOWEL DRILLS

Provided with outlining spurs and brad point for smooth boring in cross-grained or end-grained work. Wide edges on flutes provide long life, with sufficient stock for formation of new spurs when re-sharpening. Made of tough alloy steel, heat-treated, and ground for accuracy. Round shoulder has pin hole for quick removal of bit. Over-all length, 4-1/2".

No. 179—5/16" diameter shank with No. 20 threads.

Stock sizes: 3/16", 1/4", 5/16", 3/8", 7/16", 1/2", 9/16", 5/8", and 3/4".

No. 179-A—7/16" diameter shank with No. 14 threads. Stock sizes: 3/16", 1/4", 5/16", 3/8", 7/16", 1/2", 9/16", 5/8", and 3/4". Left-hand drills stocked in 3/8", 7/16", and 1/2".

No. 179-A-HS—Made of high-speed steel with 7/16" diameter shank with No. 14 thread.

Stock sizes: 3/8", 7/16" and 1/2" in both right- and left-hand drills.

No. 179-M—5/16" diameter shank with No. 18 threads. Stock sizes: 3/8", 7/16" and 1/2" in both right- and left-hand drills.



GREENLEE MACHINE DRILLS



No. 176 TAPER-HEAD DRILL

Made of tough alloy steel, heat-treated to withstand severe use, and particularly adapted to bore hard and soft wood for furniture, implement, radio and television cabinets, and truck and body woodwork. The longer drills are generally used in portable electric or pneumatic machines for car shop work. Easily sharpened. Shanks 1/2" x 2-1/4". Twist lengths as listed.

4" twist: sizes 3/16" to 1/2" by thirty-seconds, also 9/16", 5/8", and 3/4".
 6" twist: sizes 3/8", 7/16", 1/2", 9/16", 5/8", 11/16" and 3/4".
 8" twist: sizes 3/8", 7/16", 1/2", 9/16", 5/8", 11/16" and 13/16".
 10" twist: sizes 3/8", 7/16", 1/2", 9/16", 5/8", 11/16" and 13/16".
 12" twist: sizes 7/16", 1/2", 9/16", 5/8", 11/16", 13/16" and 15/16".



No. 176-D DOOR DOWEL DRILL

Specifically designed for production boring of dowel holes in doors, these bits are made of high-speed steel, heat-treated, and ground over-all for perfect straightness. Two sizes, 1/2" and 5/8" diameters, meet industry requirements. Shank 1/2" x 3-1/4", and 4" twist. Over-all length, 7-1/4"

available in right-hand or left-hand twists. Be sure to specify style desired.

Twist Length	Shank	Size
4".....	1/2" x 3-1/4"	1/2"
4".....	1/2" x 3-1/4"	5/8"



No. 177 SPUR MACHINE DRILL

Widely used in the woodworking field for cross-grain boring and other general types of work requiring smooth, accurate holes. Designed for use in power-feed boring machines using 1/2" round shank drills. Head, twist, and shank ground after hardening for accuracy. Two outlining spurs cut in advance of edges to produce exceptionally smooth, clean holes. Flutes are milled to permit outlining spurs to be maintained

for 3/4 of twist length when resharpening. Excellent for use in portable electric drills where screw point is not desired. 1/2" x 2" shank, 4" twist length.

Stock sizes 3/16", 7/32", 1/4", 9/32", 5/16", 11/32", 3/8", 13/32", 7/16", 15/32", 1/2", 9/16", 5/8", 11/16", 3/4", 13/16", 7/8", 15/16", 1", 1-1/16", 1-1/8", 1-1/4".



No. 177-A SPUR MACHINE DRILL

Similar to the No. 177 Drill described above except that the twist length is 2-1/2". Shank 1/2" x 2". A short, sturdy tool for shallow and dowel hole boring.

Stock sizes 3/8", 7/16" and 1/2".

No. 177-C-HS SPUR MACHINE DRILL

Made of high-speed steel for dowel boring. Similar to the No. 177 except with 2 1/2" twist length. Designed with 3/8" x 1 1/2" shank for collet type chucks.

Stock sizes 3/8", 7/16" and 1/2".



No. 177-M SPUR MACHINE DRILL (TAPER-SHANK)

Has tapered shank with shoulder to fit McKnight and similar machines used for dowel hole boring. Made of alloy steel, completely heat-treated and ground. Length from

shoulder to tip, 3". Over-all length, 4-3/4". For right- or left-hand operation. Be sure to specify style desired.

Stock sizes 3/8", 7/16" and 1/2".



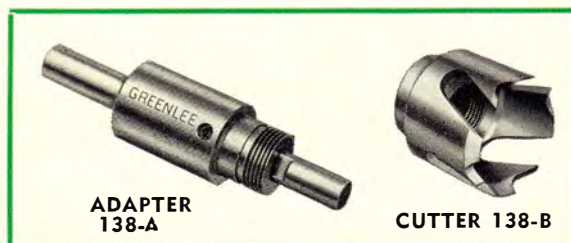
GREENLEE PLUG CUTTERS



No. 138 PLUG CUTTER ASSEMBLY

The No. 138 Plug Cutter assembly is a perfectly balanced tool for cutting plugs in the larger sizes. This consists of Adapter 138-A and Cutter 138-B in sizes listed. Adapters and Cutters priced separately. This design permits using one adapter with any of the cutter sizes listed. Cuts plugs up to 1" in thickness.

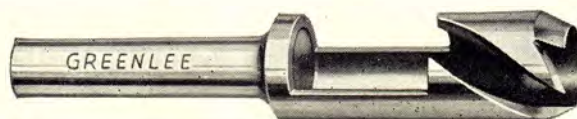
Diameters from 1-1/8" to 1-1/2" are made with cutters having three wings or series of outlining spurs and cutters. The larger sizes have four sets of cutting blades as illustrated. Stock sizes as listed.



**ADAPTER
138-A**

CUTTER 138-B

Stock cutter sizes: 1-1/8", 1-1/4", 1-3/8", 1-1/2", 1-5/8", 1-3/4", 1-7/8", and 2".



No. 140 SPIRAL PLUG CUTTER

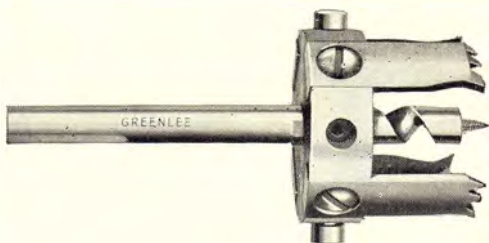
A carefully designed, one-piece plug cutter for cutting cross-grain plugs or end-grain dowels up to 2" in length, plugs up to 1" in thickness are easily cleared through the 1-1/8" opening. Barrel of the cutter is 2-3/8" in length. Shank is standard 1/2" x 2". Both inside and outside of barrel accurately ground after hardening to insure proper clearance and size.

Plug is outlined with a knife-edge rim, while stock is removed with a single cutting edge which is slightly pitched to produce an exceptionally smooth, clean cut.

Carefully made of tough alloy steel for long life. Easily sharpened. Stocked in sizes as listed.

Stock sizes: 3/8", 7/16", 1/2", 5/8", 3/4", 7/8", and 1".

GREENLEE SHEATHING TOOLS



No. 1150 SHEATHING CUTTER

Speeds cutting of insulating blower holes. Makes smooth 2-1/2" openings to 1-1/4" depth. Cutters made of high-speed steel for longer wear. Drill shank is 1/2" diameter, with 3 milled flats for use in electric drill chucks. Over-all length, 6".

Cutters are easily removed for sharpening. Special "stop screws" permit cutting to desired depth. This handy tool is easy to use from scaffold or ladder. Heavy pressure is not required, since the screw point feeds the cutter into the wood. Only one brick need be removed from brick homes to accommodate cutter. Weighs 1-1/2 pounds.



No. 1665 SIDING BAR

Ideal companion tool for Sheathing Cutter . . . speeds siding removal, nail pulling, etc. A versatile pry bar for construction or home use for opening windows, boxes, etc. Carbon spring steel, 1-3/4" wide, 14-5/8" long, 1/4" thick. Extra width reduces marring. Weighs 2 pounds.



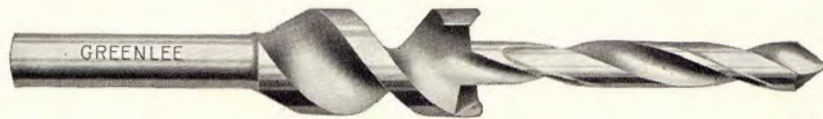
GREENLEE COUNTERSINK BITS and DRILLS



No. 180 COUNTERSINK MACHINE BIT

Ideal for boring concentric holes with a combination of two or more diameters in one operation. Has double-spur lead and double-spur counter, and can be furnished with screw point or brad point. These bits are not stocked because of the wide range of combinations possible. *When ordering,*

indicate the diameter and length of lead, diameter and length of counter, and diameter and length of shank. If quantity of work is limited, we recommend the No. 184 Multi-Spur Countersink, which can be attached to any 1/2" shank bit.



No. 183 COUNTERSINK BIT AND DRILL

Has double-spur pattern counter for countersinking a flat-bottomed hole. Taper-head drill pattern lead. Lead will not be seriously damaged if it encounters metal. Not carried in stock. *When ordering, state length and diameter of counter*

and lead plus complete shank specifications.

The No. 184 or No. 195 may prove adequate and should be considered before ordering special countersinks.



No. 185 COUNTERSINK DRILL

For occasions where adjustable type countersinks are not suitable, the solid-type No. 185, as illustrated above, can be used for boring and countersinking holes for wood screw in one operation. Taper-head drill lead. 82 degrees beveled counter. Stock sizes as listed.

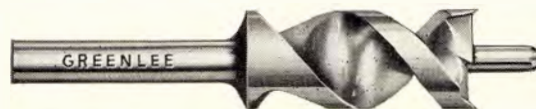
Lead	Counter	Shank
3/16" x 1-1/2"	1/2" x 2"	1/2" x 2"
7/32" x 1-1/2"	1/2" x 2"	1/2" x 2"
1/4" x 1-1/2"	1/2" x 2"	1/2" x 2"



No. 186 COUNTERSINK DRILL

Has spur machine-drill type counter and lead for boring flat-bottomed holes for screws, lag-screws, stove bolts and other fasteners to be countersunk below the surface and covered with a plug. Brad point lead, with two outlining spurs each on lead and on counter. Produces exceptionally smooth hole on both diameters. *Made of high-grade alloy steel.* Stock sizes as listed.

Lead	Counter	Shank
3/16" x 1-1/2"	1/2" x 2"	1/2" x 2"
7/32" x 1-1/2"	1/2" x 2"	1/2" x 2"
1/4" x 1-1/2"	1/2" x 2"	1/2" x 2"

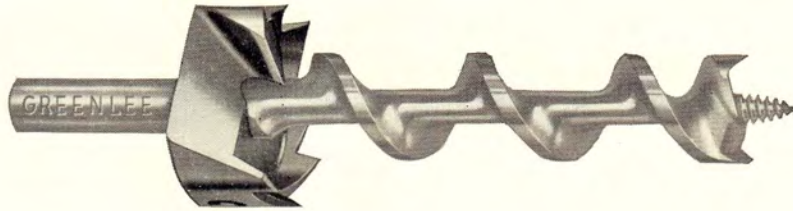


No. 189 COUNTERBORE MACHINE BIT

Used in countersinking for washers, bolt heads, etc., where a hole has already been bored. Also used for enlarging holes clear through stock. For occasional use, the No. 184 Multi-Spur Countersink Cutter, mounted on a suitable plug,

can be well-adapted for this use also. No. 189 Bits are not carried in stock. Prices on request. *When ordering specify diameter and length of counter, diameter and length of pilot, and complete shank specifications.*

GREENLEE ADJUSTABLE COUNTERSINK CUTTERS



No. 184 MULTI-SPUR COUNTERSINK CUTTER

An adjustable Countersink Cutter designed to fit any bit or drill with 1/2" shank. Cutter is held firmly in place with setscrew. This permits using various-sized counters with a wide range of bits and drills . . . *you make up your own combination as desired.*

Cutter bores smoothly with minimum of power. Can also be used as counterbore as illustrated at the left. Easily sharpened, and design permits considerable re-sharpening.

Stock sizes: 1", 1-1/8", 1-1/4", 1-3/8", 1-1/2", 1-5/8", 1-3/4", 1-7/8", 2", 2-1/8", 2-1/4", and 2-1/2".



No. 191 ADJUSTABLE COUNTERSINK CUTTER

Beveled head countersinks for flat-head wood screws. Socket setscrew holds countersink firmly in place on twist or shank of drill, permitting it to be set for various depths of boring. Over-all length, 1-1/4". Stock sizes as listed. Used with Nos. 174 to 177-S Drills shown on page 15. Countersink and drill priced separately.

Countersink Diameter	Drill Size	Countersink Diameter	Drill Size
1/2"	1/8"	1/2"	1/4"
1/2"	5/32"	5/8"	1/4"
1/2"	11/64"	5/8"	17/64"
1/2"	3/16"	5/8"	9/32"
1/2"	13/64"	5/8"	5/16"
1/2"	7/32"	3/4"	5/16"
1/2"	15/64"	3/4"	3/8"



No. 192 ADJUSTABLE COUNTERSINK CUTTER

Extension-lip pattern of head bores a smooth flat-bottomed hole. Socket setscrew holds countersink on shank or twist for boring various depths. Over-all lengths, 1-1/4" and 1-1/2", depending on size. Drill diameter becomes the shank diameter. Stock sizes as listed. Used with Nos. 174 to 177-S Drills shown on page 15. Countersink and drill priced separately.

Countersink Diameter	Drill Size	Countersink Diameter	Drill Size
1/2"	1/8"	1/2"	15/64"
1/2"	5/32"	1/2"	1/4"
1/2"	11/64"	5/8"	1/4"
1/2"	3/16"	5/8"	17/64"
1/2"	13/64"	5/8"	9/32"
1/2"	7/32"	3/4"	5/16"



No. 195 ADJUSTABLE COUNTERSINK

Extension-lip pattern bores smooth, flat-bottomed holes. Double-fluted twist with wide channels for easy chip clearance. Adjusts on drill for different boring depths. Held securely through pressure on split shank or with socket set screw. Use with Nos. 174, 175 and 177-S Drills. Twist length, 2". Shank, 1/2" x 2". Over-all length, 4". Stock sizes as listed. Countersink and drill priced separately.

Countersink Diameter	Drill Size
3/8"	3/16"
7/16"	5/32" or 3/16"
1/2"	1/8", 11/64", 3/16", 13/64", 7/32", 15/64" or 1/4"
9/16"	7/32" or 1/4"
5/8"	3/16", 7/32", 1/4", 17/64", 9/32" or 5/16"
3/4"	1/4", 9/32", 5/16" or 3/8"
7/8"	1/4", 9/32", 5/16", 11/32" or 3/8"
1"	1/4", 9/32", 5/16", 11/32" or 3/8"
1-1/8"	5/16", 11/32" or 3/8"
1-1/4"	5/16", 11/32" or 3/8"



GREENLEE ADJUSTABLE COUNTERSINKS



No. 198 ADJUSTABLE COUNTERSINK

Has two cutting edges beveled 82 degrees to correspond with taper of flat-head screws. Held securely by split shank or with socket setscrew. Flutes milled on a spiral to line up with drill flutes for efficient elimination of chips. Counter is 1-1/2" long, with standard 1/2" x 1-1/2" shank. Over-all length, 3". Requires No. 174-A or No. 175-A drills. Stock sizes as listed. Countersink and drill priced separately.

Countersink Diameter	Drill Size
1/2"	1/8", 5/32", 11/64", 3/16", 13/64", 7/32", 15/64", or 1/4"
5/8"	1/4", 17/64", 9/32", or 5/16"
3/4"	5/16" or 3/8"



No. 199 ADJUSTABLE COUNTERSINK

Recommended for countersinking where screw heads are to be below the surface of the wood. Held securely by split shank or with socket setscrew. Has milled double twist 1-1/2" long. Shank is 1/2" x 1-1/2". Over-all length, 3". Requires No. 174-A or No. 175-A drills. Stock sizes as listed. Countersink and drill priced separately.

Countersink Diameter	Drill Size
1/2"	3/16"
1/2"	7/32"
1/2"	1/4"

GREENLEE STRAIGHT-SHANK DRILLS



Nos. 174 and 174-A STRAIGHT-SHANK TAPER-POINT DRILLS

Designed for boring tapered holes for wood screws. Twist tapered to correspond with threaded part of screw, thus permitting screw to engage wood firmly for strong construction.

No. 174 has 2-1/2" twist, 6" over-all length. Used with GREENLEE Nos. 191, 192, and 195 Countersinks.

Stock sizes: 3/16", 13/64", 7/32", 15/64", 1/4", 17/64", 9/32", and 5/16".

No. 174-A has 2" twist, 4-1/2" over-all length. Used with GREENLEE Nos. 191, 192, 195, 198, and 199 Countersinks.

Stock sizes: 3/16", 13/64", 7/32", 15/64", 1/4", 17/64", 9/32", and 5/16".



Nos. 175 and 175-A STRAIGHT-SHANK DRILLS

These drills have a full diameter twist, with standard wood drill taper on head.

No. 175 has 2-1/2" twist 6" over-all length. Used with GREENLEE Nos. 191, 192, and 195 Countersinks.

Stock sizes: 1/8", 5/32", 11/64", 3/16", 13/64", 7/32", 15/64", 1/4", 17/64", 9/32", 5/16", 11/32", and 3/8".

No. 175-A has 2" twist, 4-1/2" over-all length. Used with GREENLEE Nos. 191, 192, 195, 198, and 199 Countersinks.

Stock sizes: 1/8", 5/32", 11/64", 3/16", 13/64", 7/32", 15/64", 1/4", 17/64", 9/32", and 5/16".



No. 177-S STRAIGHT-SHANK MACHINE DRILLS

For use with all types of Adjustable Countersinks, or for straight boring purposes. Identical to the No. 177 Machine Drill except that the shank diameter is the same as the twist diameter for use with GREENLEE Countersink Cutters. Made of tough alloy steel, carefully heat-treated. The head, twist, and shank are ground after hardening. Two outlying

spurs and brad point produce clean, accurate holes, particularly when boring cross-grained work. Stock sizes as listed.

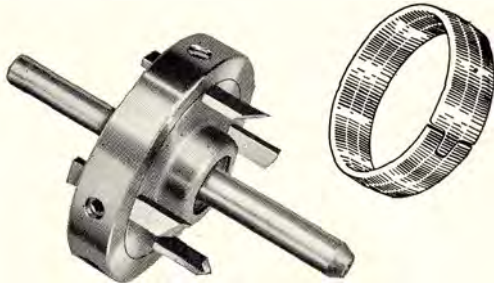
Diameter	Twist Length	Length
3/16"	2-1/2"	6"
7/32"	2-1/2"	6"
1/4"	2-1/2"	6"

TECO CONNECTOR GROOVING TOOLS

Illustrated here are the principal tools designed to cut grooves and daps for Teco Wedge-Fit connectors and Teco shear plates, widely employed in light and heavy tim-

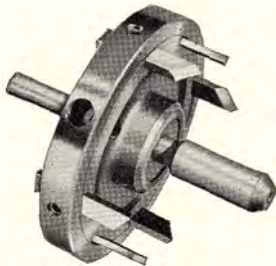
ber construction to increase the joint strength in timber structures.

These tools are made by GREENLEE on blanket specification for the account of the Timber Engineering Company, Washington, D. C., and are carried in stock only by that company.



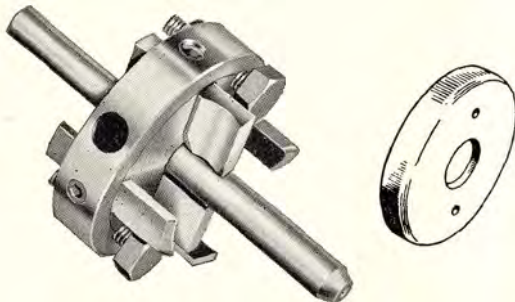
No. 12-M 4-WING CUTTERHEAD

The No. 12-M four-wing cutterhead with high-speed steel inserted cutters used in power machines only for cutting grooves for 2-1/2" diameter Teco Wedge-Fit connectors as illustrated at the left.



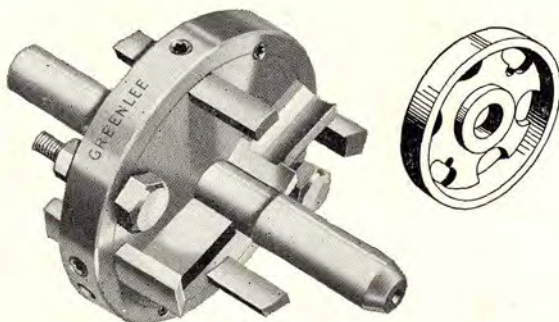
No. 14-M 6-WING CUTTERHEAD

The No. 14-M six-wing cutterhead used for cutting 4" diameter Teco Wedge-Fit connector grooves. Cutterhead may be equipped with bit for simultaneous boring and dapping, or with smooth pilot for dapping prebored lumber.



No. 22-PP CUTTERHEAD

Cutterhead No. 22-PP with high-speed steel inserted cutters for cutting daps for 2-5/8" diameter Teco shear plates. Cutterhead cuts dap to conform with contour of plate so plate fits flush with the wood surface.



No. 24-MP CUTTERHEAD

Cutterhead No. 24-MP used for cutting 4" diameter daps for shear plates. Cutterhead matches shear plate contour to allow plates to fit flush with the wood surface.



No. 10-B-9 MACHINE-SHANK BIT

MACHINE-SHANK BITS

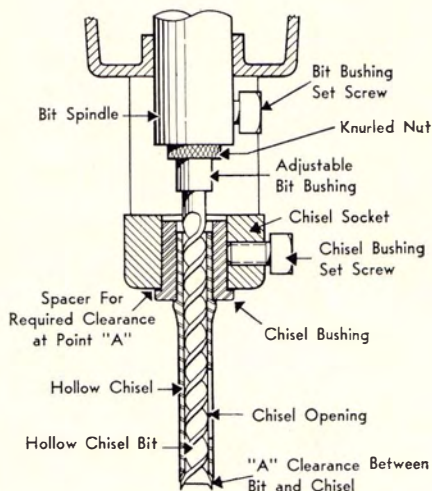
The No. 10-B-9 machine shank bit, as illustrated, is for use with No. 12-M cutterhead. Various sizes and lengths of bits are available for use with different cutterheads.

HOLLOW CHISEL and BIT MAINTENANCE

HOW TO REDUCE BREAKAGE

GREENLEE Hollow Chisels and Bits are made for long, hard use. With reasonable and proper care you can obtain good service from these dependable tools. Adjust bit and chisel carefully. If the bit head comes in contact with the cutting bevel of the chisel, excessive heating occurs and the metal will crystallize. A clearance of about $1/32$ " at point "A" should be maintained at all times. On chisels larger than $3/4$ " this clearance should be increased to $1/16$ ". Excessive clearance is equally harmful and should be avoided.

1. Insert proper size bit through chisel opening.
2. Place chisel bushing on chisel shank.
3. Slide correct bit bushing on bit shank. Be sure end of shank hits bottom of bushing.
4. Raise entire assembly up through chisel socket and tighten bit bushing lightly.
5. Position chisel bushing in chisel socket with $1/32$ " spacer.
6. Push chisel upward, then tighten chisel bushing set screw.
7. Push bit upward as far as it will go. Tighten bit set screw against bushing securely. Screw knurled nut up as far as it will go.
8. Loosen chisel and remove spacer. Square up chisel with fence. Raise chisel up as far as it will go. Tighten chisel set screw against the bushing flat.



To obtain maximum performance from your GREENLEE Hollow Chisels and Bits be sure to (1) fasten tools securely, (2) maintain proper spindle alignment, (3) replace badly worn bushings, (4) replace badly worn bits, (5) *keep tools sharpened and in good condition at all times.* (See next column of this page for detailed sharpening instructions.)

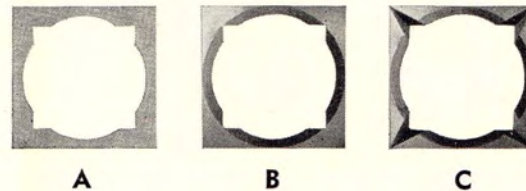
SHARPENING HOLLOW CHISELS

When the cutting edges of hollow chisels become dulled, nicked or cracked they can be reconditioned accurately and economically on the GREENLEE Hollow-Chisel Sharpener. Shown on page 5.

If the chisel is nicked or cracked the damaged portion should be first ground off square on an emery wheel as shown in "A". The hollow chisel is then clamped in the machine vertically, centering the pilot of the cutter in the bore of the chisel by screwing down spindle until cutter comes in contact with edges of chisel.

After lowering cutter to contact with chisel, turn crank and screw spindle *downward* until outside angle of cutter has cut to the corner of chisel as shown in "B". Cutter should make a fairly heavy cut. Any burrs can be easily removed with a file or abrasive stick.

The corners are then grooved with a square file as shown in "C". After completing these simple operations the chisel will be sharp, properly shaped and ready for use.



SHARPENING HOLLOW CHISEL BITS

A Hollow Chisel Bit should produce a fine, well-broken chip that can be readily cleared through the chisel. It can only do this when its edges are sharp and shaped as found on a new tool. File the cutting edges of a bit *from below*, working through the throat. The spurs and side lips where applicable, should be sharp and lined up evenly with the cutting edges. Filing spurs should be done on the *inside only* on the regular Hollow Chisel Bits. On the Hard-Wear type the filing is done on top of the broad face spurs at the correct angle. Half-round and taper warding files are best suited to bit sharpening.

OBLONG MORTISING PRECAUTIONS

When making oblong mortises up to $1/2$ " in width do not make consecutive cuts. The resulting unequal pressure brought on by cutting with three sides of the chisel may cause it to bend or break. If the chisel bends and contacts the rotating bit both tools can be damaged beyond repair. Alternate strokes should be used thus equalizing pressure by cutting on four sides with the first passes and two sides on the final passes, taking care to cut in center of chisel.

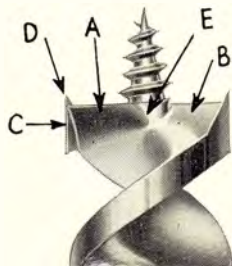
SHARPENING INSTRUCTIONS

BIT SHARPENING INSTRUCTIONS

Wood boring tools of all types will give long and satisfactory service if they are kept in good condition by the user. It is well known, however, that improper sharpening shortens the life of many tools. With this in mind we offer here some suggestions for sharpening, which will be helpful to many who are not experienced in this work.

The first requirement for correctly sharpening bits is proper files. Three separate files are necessary: a square, a taper warding, and a half-round, all 4- or 5-inch, either No. 0 or No. 1 cut. This file equipment will take care of all sizes from 3/16- to 1-inch. For larger sizes, 6- and 8-inch files are necessary.

The boring tools most commonly used have outlining spurs for smooth boring and, therefore, to make the instructions more clear, we show on this page an illustration of the head of a double-spur machine bit. The instructions will refer particularly to tools of this type, although the method of edge filing applies to all patterns.



The cutting edges should be sharpened with the *flat* side of a half-round or square file, stroking through the throat (A). The top of the cutting edge (B) should be lightly filed, merely to clean the surface, and we would caution not to remove too much stock at this point, as the chip lifting ability of the cutting edge would then be destroyed. The side lips (C) should be even with the cutting edges, and filed on the *inside only* with a *square file*.

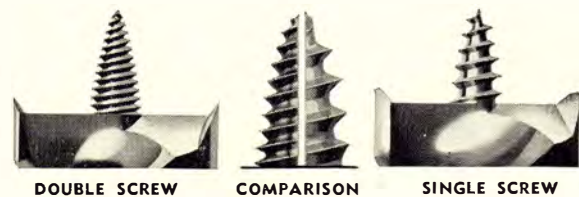
Outlining spurs (D), which sever the fibers of wood in cross-grain boring, should be keen and of proper shape. A new tool should be used as a guide in this operation, and

the original form should be retained as far as possible. File on the *inside* of the spurs at the top (D) *only*, using a taper warding file with one edge ground off to prevent notching the base of the spur. *Do not file on the outside of the spurs* as this reduces the diameter of the head. It is of great importance that spurs project beyond cutting edges, and care should be used in refiling to preserve their relative position and to keep them of even height.

In filing under the base of the screw point, the *half-round file* should be used, which retains the radius at (E). This style of file also prevents under-cutting the screw point, which weakens this important part of a machine bit.

COMPARISON OF POINTS

Machine Bits shown as being carried in our stock are regularly made with screw point of pitch to best suit general requirements. We can make special bits, however, with slower or faster pitch of threads, either single or double, or with brad point to suit particular requirements.



A single screw has only one thread or spiral running from the tip of the point, while the double screw has two threads starting from the opposite sides at the tip and running parallel down to the base. One complete thread may be eliminated from a double screw point, thus making it into a single screw, without changing the pitch of the thread.

A No. 12 double screw and a No. 12 single screw will bore at exactly the same speed, providing the wood is such that bits follow the natural feed of the points, although the former will register with a No. 24 screw pitch gauge while the latter agrees with a No. 12.

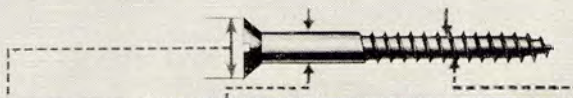
Practically all double-twist extension-lip machine bits have fine pitch double-thread screw points, while other patterns have single-screw points, fine to medium pitch.

BORING CHART FOR WOOD SCREWS

HOW TO USE THIS CHART

The table of wood screw specifications simplifies the selection of the bit or drill size best suited to your requirements. The fractional equivalents and undersize and oversize decimals indicate how close a bit of given fractional size will bore to the actual screw dimension and whether the fit will be snug or loose. In selecting a tool size for the pilot hole (for threaded portion of screw), note that root diameters are average dimensions measured at the middle of the threaded portion. On some screws the root diameter tapers slightly from the end of the screw, increasing toward the head. It is usually good

practice to bore the pilot hole the same size as the root diameter in hardwoods, such as oak, and about 15% smaller for soft woods, such as pine and Douglas fir. In some cases, allowances can be made to advantage for moisture content and other varying factors. This same rule can be used for shank holes. The SHANK DIAMETERS shown below are standard specifications subject to tolerances of $\pm .004$. MAXIMUM HEAD DIAMETERS are also standard specifications which apply to flat and oval-head screws. Head sizes run from 5% to 10% smaller for round-head screws.



NO. OF SCREW	MAXIMUM HEAD DIAMETER	SHANK DIAMETER		ROOT DIAMETER		THREADS PER INCH	NO. OF SCREW
		BASIC DEC. SIZE	NEAREST FRACTIONAL EQUIVALENT	AVERAGE DEC. SIZE	NEAREST FRACTIONAL EQUIVALENT		
0	.119	.060	$\frac{1}{16}$ OVERSIZE .002	.040	$\frac{3}{64}$ OVERSIZE .007	32	0
1	.146	.073	$\frac{5}{64}$ OVERSIZE .005	.046	$\frac{3}{64}$ BASIC SIZE	28	1
2	.172	.086	$\frac{3}{32}$ OVERSIZE .007	.054	$\frac{1}{16}$ OVERSIZE .008	26	2
3	.199	.099	$\frac{7}{64}$ OVERSIZE .010	.065	$\frac{1}{16}$ UNDERSIZE .002	24	3
4	.225	.112	$\frac{7}{64}$ UNDERSIZE .003	.075	$\frac{5}{64}$ OVERSIZE .003	22	4
5	.252	.125	$\frac{1}{8}$ BASIC SIZE	.085	$\frac{5}{64}$ UNDERSIZE .007	20	5
6	.279	.138	$\frac{9}{64}$ OVERSIZE .002	.094	$\frac{3}{32}$ BASIC SIZE	18	6
7	.305	.151	$\frac{5}{32}$ OVERSIZE .005	.102	$\frac{7}{64}$ OVERSIZE .007	16	7
8	.332	.164	$\frac{5}{32}$ UNDERSIZE .007	.112	$\frac{7}{64}$ UNDERSIZE .003	15	8
9	.358	.177	$\frac{11}{64}$ UNDERSIZE .005	.122	$\frac{1}{8}$ OVERSIZE .003	14	9
10	.385	.190	$\frac{3}{16}$ UNDERSIZE .002	.130	$\frac{1}{8}$ UNDERSIZE .005	13	10
11	.411	.203	$\frac{13}{64}$ BASIC SIZE	.139	$\frac{9}{64}$ OVERSIZE .001	12	11
12	.438	.216	$\frac{7}{32}$ OVERSIZE .003	.148	$\frac{9}{64}$ UNDERSIZE .007	11	12
14	.491	.242	$\frac{1}{4}$ OVERSIZE .008	.165	$\frac{5}{32}$ UNDERSIZE .009	10	14
16	.544	.268	$\frac{17}{64}$ UNDERSIZE .002	.184	$\frac{3}{16}$ OVERSIZE .003	9	16
18	.597	.294	$\frac{19}{64}$ OVERSIZE .003	.204	$\frac{13}{64}$ UNDERSIZE .001	8	18
20	.650	.320	$\frac{5}{16}$ UNDERSIZE .007	.223	$\frac{7}{32}$ UNDERSIZE .004	8	20
24	.756	.372	$\frac{3}{8}$ OVERSIZE .003	.260	$\frac{1}{4}$ UNDERSIZE .010	7	24

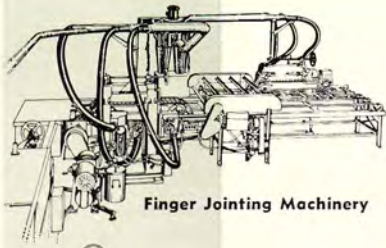
ACTUAL WOOD SCREW SHANK SIZES

To determine the size of a screw visually, lay the screw shank on the silhouette.

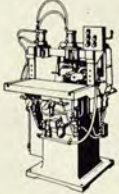
- No. 0 
- No. 1 
- No. 2 
- No. 3 
- No. 4 
- No. 5 
- No. 6 
- No. 7 
- No. 8 
- No. 9 
- No. 10 
- No. 11 
- No. 12 
- No. 14 
- No. 16 
- No. 18 
- No. 20 
- No. 24 

Specialized Equipment for Greater Profits . . .

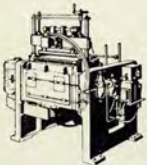
GREENLEE WOODWORKING MACHINERY



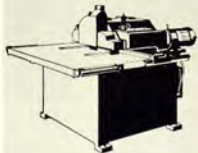
Finger Jointing Machinery



No. 310 Dowel Borer



No. 620 Dovetailer



No. 431 Rip Saw



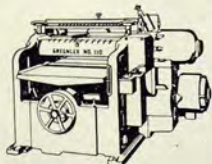
No. 435 Cut-Off Saw



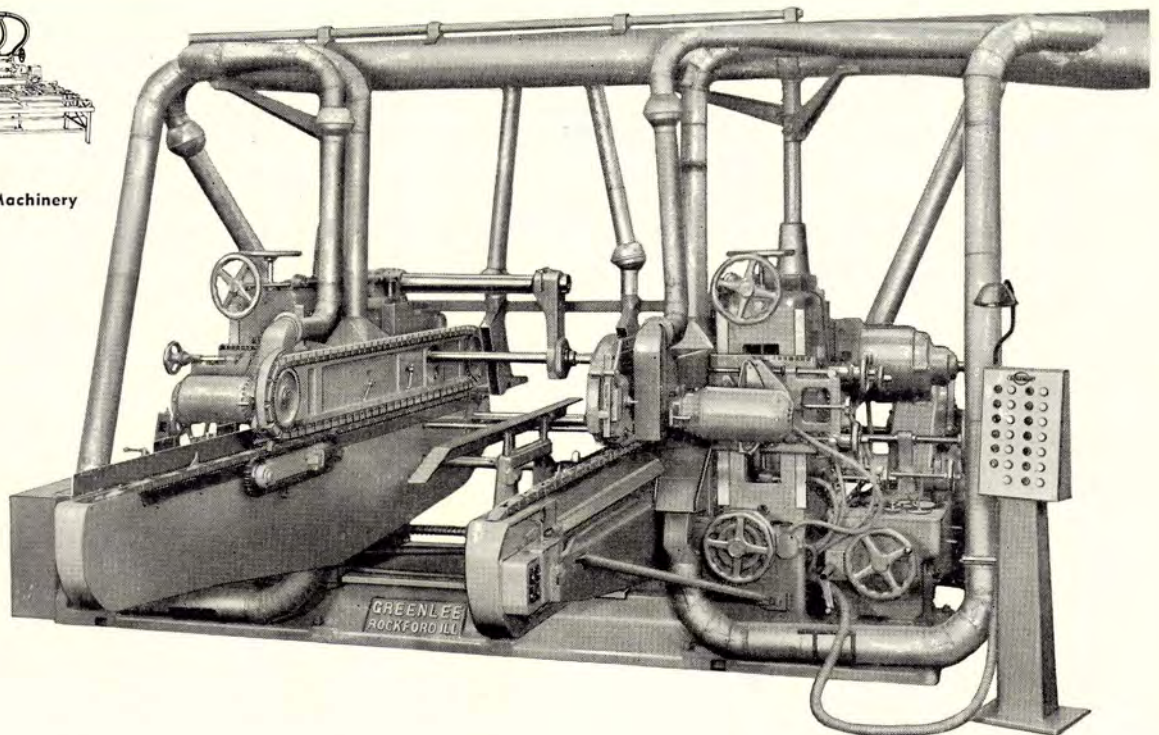
No. 356 Single Borer



No. 386-C Gang Borer



No. 110 Six-Roll Planer

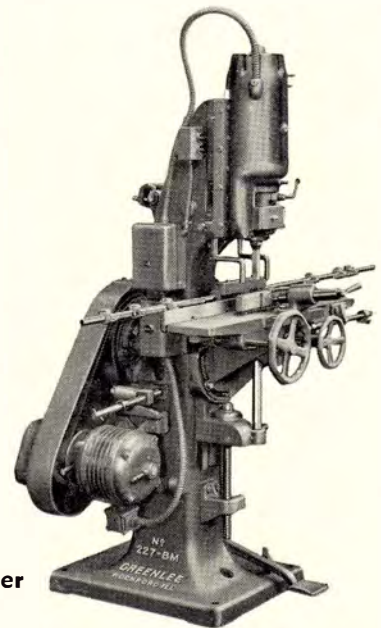


No. 545
Double-End Tenoner

Greenlee Woodworking Machines

Greenlee Bros. & Co. has concentrated on designing and building machines for specialized woodworking operations since its founding in 1866. The *first* hollow chisel mortiser was invented by Ralph S. and Robert L. Greenlee.

Machines were later introduced for planing, shaping, sawing, boring and tenoning. This specialization has helped Greenlee gain a reputation for quality and precision which has endured through the years.



No. 227-BM
Hollow-Chisel Mortiser

No. 532 Single-End Tenoner

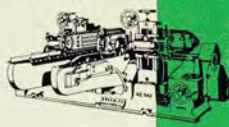
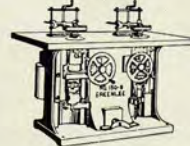
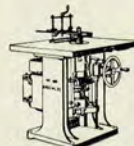
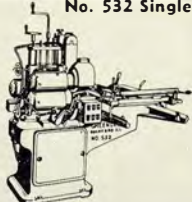
No. 165 Single Shaper

No. 495 Variety Saw

No. 180-B Double Shaper

No. 212 Multiple Mortiser

No. 542 Double Cut-Off Saw



TOOLS FOR CRAFTSMEN

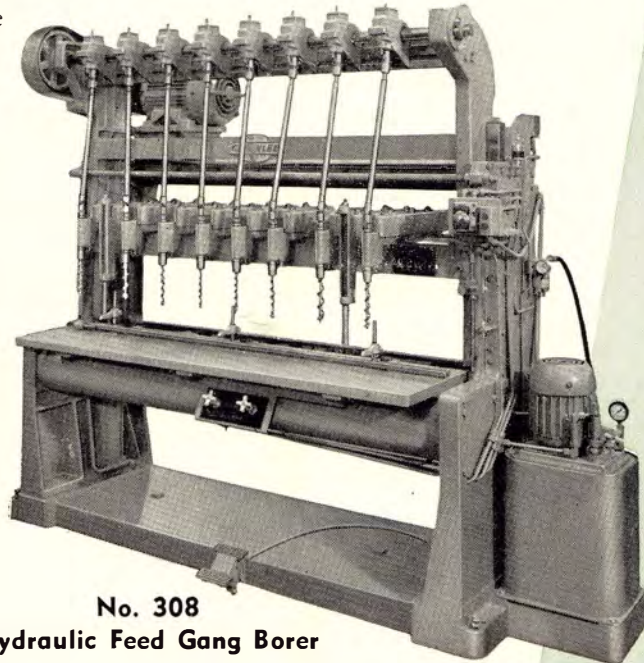
... and GREENLEE TOOLS

GREENLEE

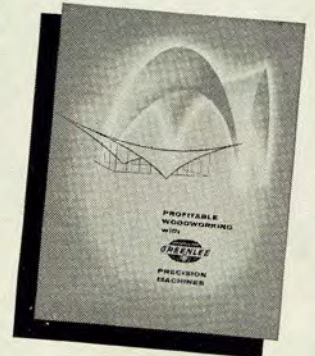


MORTISING AND BORING MACHINES, such as those made by Greenlee, and illustrated here, can function at peak efficiency *only* when using the proper tools. Why not let the No. 308 Hydraulic Feed Gang Borer, or one of the other Greenlee Machines, equipped with accurate, sharp, smooth cutting Greenlee Tools help solve your mortising and boring problems.

Manufacturing the finest in Woodworking Machinery and Tools, under one policy of quality workmanship and materials, gives Greenlee first hand knowledge of every requirement. This know-how helps Greenlee design and produce both Machinery and Tools that will continually give top performance. Use this Greenlee production combination as your best profit insurance.



No. 308
Hydraulic Feed Gang Borer



For Additional Information
On Greenlee Woodworking
Machinery, write:

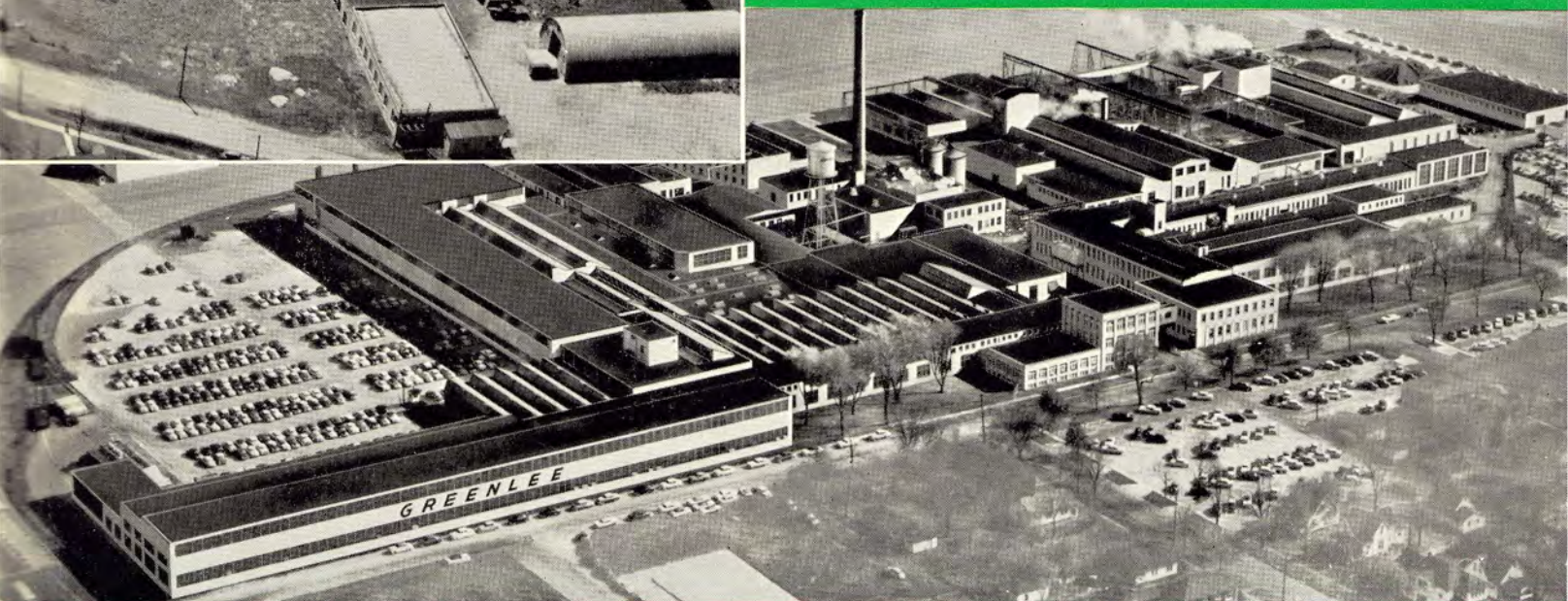
GREENLEE BROS. & CO.
Rockford, Illinois

And Ask For
CATALOG
W-504



GENOA, ILLINOIS
PLANT

GENERAL OFFICE AND MAIN PLANT, ROCKFORD, ILLINOIS



TOOLS FOR CRAFTSMEN



PRODUCTS OF HIGHEST QUALITY

TOOLS FOR WOODWORKERS

Auger Bits
Power Bits
Drills
Expansive Bits
Car Bits, Augers
Electricians' Auger Bits
Chisels and Gouges
Drawknives
Spiral Screw Drivers
Automatic Push Drills
Turning Tools
and Many Others

TOOLS FOR ELECTRICIANS, PLUMBERS, CONSTRUCTION

Hydraulic Power Pumps
Hydraulic Pipe Benders
Hydraulic Pipe Pushers
Tubing Benders
Cable Pullers
Plumbers' Bit Sets
Knockout Punches and Cutters
Hydraulic Knockout Punch Driver
Radio Chassis Punches
and Many More

MORTISING & BORING TOOLS

Hollow Chisels
Hollow Chisel Bits
Machine Bits
Router Bits
Drills
Plug Cutters
Countersink Cutters
Countersink Drills
Split-Shank Countersinks
and Many More

GREENLEE TOOL CO.
2136 TWELFTH STREET
ROCKFORD, ILLINOIS



GREENLEE TOOL Co.

DIVISION OF GREENLEE BROS. & CO.

MANUFACTURERS

TOOLS FOR CRAFTSMEN

ROCKFORD, ILLINOIS
U. S. A.

TELEPHONE
3-4881

ALBERT H. EGGERS
PRESIDENT
LESLIE H. GEDDES
EXEC. VICE PRESIDENT
RAYMOND J. SAMUELSON
VICE PRESIDENT
CLIFFORD G. WOOD
SECRETARY

F. M. #9

Attention:

Gentlemen:

You recently requested catalog 34M, which we enclose along with list price sheet M34-D. This will give you descriptive information and list prices applying to mortising, boring, and routing tools of our manufacture.

We are making arrangements to forward to you our Boring Chart for Wood Screws, under separate cover. This will be forwarded in the very near future, marked for your personal attention.

The consumer discount from the enclosed list price sheet is less 33-1/3%, f.o.b. Rockford, Illinois.

Yours truly,

D. E. Wilson
Tool Sales

DEW/nac

Enc.
34-M
M34-D



PRICE LIST

No. M34-D

EFFECTIVE
NOVEMBER 1, 1956
SUPERSEDES
M34-C
DATED JUNE 15, 1955

APPLIES TO CATALOG 34-M

MORTISING, BORING, AND ROUTING TOOLS FOR MACHINE USE

SHIPPING TERMS: All tools covered by this price list are subject to full rail freight allowance on shipments of 100 lbs. or more in United States and Canada.

CREDIT TERMS: A 2% cash discount is allowed for payment on the 10th of month following date of invoice.

PRICES: All prices are subject to change without notice. We reserve the right to invoice at prices prevailing at time of shipment. Minimum invoice charge \$3.00.

GREENLEE TOOL CO., ROCKFORD, ILLINOIS, U.S.A.
DIVISION OF GREENLEE BROS. & CO.
PHONE 3-4881

Cat. No.	DESCRIPTION	Price, Each	Weight, Ounces	Cat. No.	DESCRIPTION	Price, Each	Weight, Ounces
Hollow Chisels							
100-B	OBLONG BAR HOLLOW CHISEL				7/16	11.80	4
	4" Blade Catalog Page 3				1/2	12.55	4
	Size, Inch				5/8	15.50	6
	3/8 x 9/16	\$14.20	4		3/4	17.25	11
	3/8 x 5/8	14.20	4		7/8	19.00	17
	3/8 x 3/4	15.85	5		1	20.70	18
	3/8 x 13/16	15.85	5				
101-H	HARD-WEAR HOLLOW CHISEL			101-B	REGULAR HOLLOW CHISEL		
	4" Blade Catalog Page 1				4" Blade Catalog Page 1		
	Size, Inch				Size, Inch		
	3/8	8.00	3		1/4	8.35	3
	7/16	8.75	3		5/16	8.35	3
	1/2	9.50	4		3/8	8.00	3
	9/16	11.35	4		7/16	8.75	3
	5/8	12.10	5		1/2	9.50	4
	3/4	13.80	9		9/16	11.35	4
	7/8	15.60	10		5/8	12.10	5
102-B	REGULAR HOLLOW CHISEL				11/16	13.00	6
	2-3/4" Blade Catalog Page 2				3/4	13.80	10
	Size, Inch				13/16	14.70	10
	1/4	6.40	3		7/8	15.60	11
	5/16	6.40	3		1	17.45	13
	3/8	6.40	3				
102-H	HARD-WEAR HOLLOW CHISEL			101-B	OBLONG HOLLOW CHISEL		
	2-3/4" Blade Catalog Page 2				4" Blade Catalog Page 3		
	Size, Inch				Size, Inch		
	1/4	6.40	3		5/16 x 3/8	9.45	4
	5/16	6.40	3		3/8 x 7/16	9.45	4
	3/8	6.40	3		3/8 x 1/2	9.80	4
103-B	REGULAR HOLLOW CHISEL				3/8 x 9/16	10.30	4
	5" Blade Catalog Page 2				7/16 x 1/2	10.30	4
	Size, Inch				1/2 x 5/8	11.40	4
	3/8	11.05	3		1/2 x 3/4	12.20	6
	7/16	11.80	4				
	1/2	12.55	4	104-B	REGULAR HOLLOW CHISEL		
	9/16	14.75	5		6-1/2" Blade Catalog Page 4		
	5/8	15.50	6		Size, Inch		
	3/4	17.25	10		3/8	17.15	16
	7/8	19.00	18		7/16	18.15	16
	1	20.70	18		1/2	19.00	17
	1-1/8	22.45	18		9/16	20.00	18
	1-1/4	24.15	20		5/8	20.95	14
103-H	HARD-WEAR HOLLOW CHISEL				3/4	22.80	14
	5" Blade Catalog Page 2				7/8	24.90	21
	Size, Inch				1	26.90	21
	3/8	11.05	3		1-1/8	29.50	23
(Continued Next Column)					1-1/4	31.85	34
					1-1/2	37.55	36
					1-3/4	44.40	58
					2	52.25	56



Fine Tools for Craftsmen

Cat. No.	DESCRIPTION	Price, Each	Weight, Ounces
105-B	REGULAR HOLLOW CHISEL		
	8" Blade Catalog Page 4		
	Size, Inch		
	3/4	24.60	9
	7/8	26.90	13
	1	29.15	15
	1-1/8	32.10	16
	1-1/4	34.75	17
	1-1/2	41.40	23
	1-3/4	48.75	26
	2	57.00	32

Hollow Chisel Bits

120-B	REGULAR HOLLOW CHISEL BITS		
	Catalog Pages 1 and 3		
	Size, Inch		
	1/4	3.15	1
	5/16	3.15	2
	3/8	3.15	2
	7/16	3.35	2
	1/2	3.40	3
	9/16	3.75	3
	5/8	4.10	5
	11/16	4.70	5
	3/4	4.95	5
	13/16	5.65	6
	7/8	6.25	7
	1	7.30	9

120-H	HARD-WEAR HOLLOW CHISEL BITS		
	Catalog Pages 1 and 3		
	Size, Inch		
	1/4	3.40	1
	5/16	3.40	2
	3/8	3.40	2
	7/16	3.60	2
	1/2	3.70	3
	9/16	4.05	3
	5/8	4.50	5
	3/4	5.30	5
	7/8	6.60	7

120-T	SINGLE-TWIST HOLLOW CHISEL BITS		
	Catalog Pages 1 and 3		
	Size, Inch		
	1/4	3.40	1
	5/16	3.40	2
	3/8	3.40	2

121-B	REGULAR HOLLOW CHISEL BITS		
	Catalog Page 2		
	Size, Inch		
	1/4	3.15	1
	5/16	3.15	2
	3/8	3.15	2

121-H	HARD-WEAR HOLLOW CHISEL BITS		
	Catalog Page 2		
	Size, Inch		
	1/4	3.40	1
	5/16	3.40	2
	3/8	3.40	2

122-B	REGULAR HOLLOW CHISEL BITS		
	Catalog Page 2		
	Size, Inch		
	3/8	3.75	2
	7/16	3.80	3
	1/2	3.85	3
	9/16	3.95	3
	5/8	4.45	5
	3/4	5.20	6
	7/8	6.60	7
	1	7.50	8
	1-1/8	8.05	9
	1-1/4	8.85	11

121-T	SINGLE-TWIST HOLLOW CHISEL BITS		
	Catalog Page 2		
	Size, Inch		
	1/4	3.40	1
	5/16	3.40	2
	3/8	3.40	2

122-H	HARD-WEAR HOLLOW CHISEL BITS		
	Catalog Page 2		
	Size, Inch		
	3/8	4.05	2
	7/16	4.10	3
	1/2	4.15	3
	5/8	4.70	5
	3/4	5.65	6
	7/8	6.95	7
	1	7.80	8

123-B	REGULAR HOLLOW CHISEL BITS		
	Catalog Page 4		
	Size, Inch		
	3/8	4.75	3
	7/16	4.80	3
	1/2	4.85	3
	9/16	5.10	4
	5/8	5.50	6
	3/4	6.30	7
	7/8	8.00	10
	1	9.10	12
	1-1/8	9.95	13
	1-1/4	11.00	14
	1-1/2	12.95	18
	1-3/4	15.60	21
	2	17.60	26

124-B	REGULAR HOLLOW CHISEL BITS		
	Catalog Page 4		
	Size, Inch		
	3/8	5.50	3
	7/16	5.65	4
	1/2	5.75	4
	9/16	6.05	6
	5/8	6.35	8
	3/4	7.70	9
	7/8	9.30	13
	1	10.75	15
	1-1/8	11.60	16
	1-1/4	12.30	17
	1-1/2	14.10	23
	1-3/4	16.90	26
	2	18.90	32

125-B	REGULAR HOLLOW CHISEL BITS		
	Catalog Page 4		
	Size, Inch		
	3/4	7.90	9
	7/8	9.65	13
	1	11.60	15
	1-1/8	12.40	16
	1-1/4	13.25	17
	1-1/2	15.50	23
	1-3/4	18.25	26
	2	22.40	32

Machine Boring Tools

6-M	MACHINE EXPANSIVE BITS		
	Catalog Page 7		
	Size, Inch		
	6-M Complete	9.60	10
	6-MC Cutter	1.90	1

138	PLUG CUTTERS		
	Catalog Page 12		
	Size, Inch		
	1-1/8	19.65	5
	1-1/4	20.65	6
	1-3/8	21.70	6
	1-1/2	23.65	7
	1-5/8	27.55	7
	1-3/4	31.50	8
	1-7/8	35.40	10
	2	39.35	10

138-A	PLUG CUTTER ADAPTER	21.40	10
-------	----------------------------	-------	----

140	SPIRAL PLUG CUTTERS		
	Catalog Page 12		
	Size, Inch		
	3/8	6.80	3
	7/16	6.80	3
	1/2	6.80	4
	5/8	7.95	4
	3/4	8.80	4
	7/8	9.85	5
	1	10.85	5

Cat. No.	DESCRIPTION	Price, Each	Weight, Ounces
141	ROUTING BITS Alloy Steel, Left-Hand Catalog Page 6		
	Size, Inch		
	3/16	2.95	2
	1/4	2.95	2
	5/16	2.95	2
	3/8	2.95	2
	7/16	2.95	2
	1/2	2.95	2
	9/16	3.45	3
	5/8	3.95	3
	3/4	4.80	3
	7/8	5.60	4
	1	6.45	4
142	ROUTING BITS Alloy Steel, Right-Hand Catalog Page 6		
	Size, Inch		
	3/16	2.85	2
	1/4	2.85	2
	5/16	2.85	2
	3/8	2.85	2
	7/16	2.85	2
	1/2	2.85	2
	9/16	3.30	3
	5/8	3.80	3
	3/4	4.55	3
	7/8	5.35	4
	1	6.15	4
	1-1/8	6.95	4
	1-1/4	7.90	5
143	SINGLE-FLUTE ROUTERS High-Speed Steel Catalog Page 6		
	Size, Inch		
	1/8	1.65	1
	5/32	1.65	1
	3/16	1.65	1
	7/32	1.65	1
	1/4	1.65	1
	5/16	1.80	1
	3/8	2.05	1
143-D	DOUBLE-END ROUTERS High-Speed Steel Catalog Page 6		
	Size, Inch		
	1/8	2.55	1
	5/32	2.55	1
	3/16	2.55	1
	7/32	2.55	1
	1/4	2.55	1
	5/16	2.85	1
	3/8	3.10	1
146	ROUTING BITS High-Speed Steel Right-Hand Catalog Page 6		
	Size, Inch		
	3/16	4.35	2
	1/4	4.35	2
	5/16	4.35	2
	3/8	4.35	2
	7/16	4.35	2
	1/2	4.35	2
	9/16	5.20	3
	5/8	6.10	3
	3/4	7.80	3
	7/8	9.55	4
	1	11.30	4
149	MULTI-SPUR MACHINE BITS Catalog Page 7		
	Size, Inch		
	1/2	4.55	4
	9/16	4.55	4
	5/8	4.55	4
	11/16	4.55	4
	3/4	4.55	5
	13/16	4.55	5
	7/8	4.55	5
	15/16	4.70	5
	1	4.85	5
	1-1/16	5.00	5

(Continued Next Column)

Cat. No.	DESCRIPTION	Price, Each	Weight, Ounces
	1-1/8	5.10	6
	1-3/16	5.30	6
	1-1/4	5.60	6
	1-5/16	5.95	6
	1-3/8	6.15	6
	1-7/16	6.95	6
	1-1/2	7.80	7
	1-9/16	8.00	7
	1-5/8	8.20	7
	1-11/16	8.45	7
	1-3/4	8.75	7
	1-13/16	9.00	8
	1-7/8	9.25	8
	1-15/16	9.65	8
	2	10.05	8
	2-1/8	11.30	13
	2-1/4	13.55	13
	2-3/8	15.80	13
	2-1/2	17.65	14
	2-5/8	19.85	15
	2-3/4	22.00	15
	2-7/8	24.25	16
	3	26.45	16
	3-1/4	54.60	26
	3-1/2	58.80	28
	3-3/4	63.00	31
	4	67.20	31
150	DOUBLE-SPUR MACHINE BITS 4" Twist, 1/2" Shank Catalog Page 8		
	Size, 16th		
	4	3.75	2
	5	3.75	3
	6	3.75	3
	7	3.80	4
	8	3.90	4
	9	4.00	4
	10	4.10	4
	11	4.15	4
	12	4.30	5
	13	4.45	5
	14	4.70	5
	15	4.95	5
	16	5.30	6
	17	5.55	7
	18	5.90	7
	19	6.15	8
	20	6.50	8
	21	6.80	8
	22	7.15	9
	23	7.45	9
	24	7.75	10
150	DOUBLE-SPUR MACHINE BITS 6" Twist, 1/2" Shank Catalog Page 8		
	Size, 16th		
	4	3.90	3
	5	3.90	3
	6	3.90	3
	7	3.95	4
	8	4.05	4
	9	4.15	5
	10	4.25	5
	11	4.30	5
	12	4.45	6
	13	4.60	6
	14	4.85	7
	15	5.15	7
	16	5.50	8
	17	5.85	9
	18	6.15	10
	19	6.50	11
	20	6.80	11
	21	7.15	12
	22	7.45	12
	23	7.80	12
	24	8.10	13
	25	8.45	14

(Continued Next Page)



Fine Tools for Craftsmen

Cat. No.	DESCRIPTION	Price, Each	Weight, Ounces
150	(Continued)		
26		8.90	14
27		9.30	17
28		9.75	17
29		10.20	17
30		10.50	17
31		10.95	18
32		11.40	19

150 DOUBLE-SPUR MACHINE BITS

12" Twist, 1/2" Shank Cat. Page 8			
Size, 16th			
6	.....	5.95	5
7	.....	6.10	5
8	.....	6.25	6
9	.....	6.35	6
10	.....	6.50	8
11	.....	6.65	8
12	.....	6.90	10
13	.....	7.15	11
14	.....	7.45	12
15	.....	7.90	14
16	.....	8.40	15
17	.....	8.90	16
18	.....	9.40	17
19	.....	9.90	18
20	.....	10.40	20
22	.....	11.40	23
24	.....	12.30	26
28	.....	14.85	33
32	.....	17.35	34

150 DOUBLE-SPUR MACHINE BITS

12" Twist, 3/4" Shank Cat. Page 8			
Size, 16th			
6	.....	5.95	7
7	.....	6.10	8
8	.....	6.25	9
9	.....	6.35	10
10	.....	6.50	10
11	.....	6.65	12
12	.....	6.90	13
13	.....	7.15	13
14	.....	7.45	16
15	.....	7.90	16
16	.....	8.40	18
17	.....	8.90	18
18	.....	9.40	19
19	.....	9.90	19
20	.....	10.40	21
22	.....	11.40	27
24	.....	12.30	32
28	.....	14.85	35
32	.....	17.35	41

150 DOUBLE-SPUR MACHINE BITS

14" Twist, 3/4" Shank Cat. Page 8			
Size, 16th			
6	.....	7.65	8
7	.....	7.75	8
8	.....	7.85	9
9	.....	7.95	10
10	.....	8.05	11
11	.....	8.15	12
12	.....	8.25	13
13	.....	8.90	15
14	.....	9.50	16
15	.....	10.15	16
16	.....	10.75	16
17	.....	11.45	20
18	.....	12.05	22
19	.....	12.65	24
20	.....	13.25	26
22	.....	14.50	29
24	.....	15.80	31
28	.....	19.00	40
32	.....	22.15	47

Cat. No.	DESCRIPTION	Price, Each	Weight, Ounces
150	DOUBLE-SPUR MACHINE BITS		
	Brad Point		
	Price On Application		

153 FLAT-CUT MACHINE BITS

Price On Application

151 EXTENSION-LIP MACHINE BITS

4" Twist, 1/2" Shank Catalog Page 8

Size, 16th			
4	.....	3.55	2
5	.....	3.55	3
6	.....	3.55	3
7	.....	3.60	4
8	.....	3.70	4
9	.....	3.80	4
10	.....	3.90	4
11	.....	3.95	4
12	.....	4.05	5
13	.....	4.30	5
14	.....	4.65	5
15	.....	4.95	5
16	.....	5.25	6

151 EXTENSION-LIP MACHINE BITS

6" Twist, 1/2" Shank Catalog Page 8

Size, 16th			
4	.....	3.70	3
5	.....	3.70	3
6	.....	3.70	3
7	.....	3.75	4
8	.....	3.85	4
9	.....	3.95	5
10	.....	4.05	5
11	.....	4.10	5
12	.....	4.20	6
13	.....	4.45	6
14	.....	4.80	7
15	.....	5.15	7
16	.....	5.45	8

155 SOLID-CENTER MACHINE BITS

4" Twist, 1/2" Shank Catalog Page 8

Size, 16th			
4	.....	3.00	2
5	.....	3.00	3
6	.....	3.00	3
7	.....	3.05	4
8	.....	3.10	4
9	.....	3.15	4
10	.....	3.20	4
11	.....	3.25	4
12	.....	3.30	5
13	.....	3.50	5
14	.....	3.75	5
15	.....	4.00	5
16	.....	4.30	6
17	.....	4.50	7
18	.....	4.75	7
19	.....	5.00	8
20	.....	5.30	8

155 SOLID-CENTER MACHINE BITS

6" Twist, 1/2" Shank Catalog Page 8

Size, 16th			
4	.....	3.15	3
5	.....	3.15	3
6	.....	3.15	3
7	.....	3.20	4
8	.....	3.25	4
9	.....	3.30	5
10	.....	3.35	5
11	.....	3.45	5
12	.....	3.55	6
13	.....	3.70	6
14	.....	3.95	7
15	.....	4.25	7
16	.....	4.45	8
17	.....	4.75	9
18	.....	5.00	10
19	.....	5.30	11
20	.....	5.50	11

Cat. No.	DESCRIPTION	Price, Each	Weight, Ounces
155 SOLID-CENTER MACHINE BITS			
	8" Twist, 1/2" Shank Catalog Page 8		
	Size, 16th		
	4	3.60	3
	5	3.60	4
	6	3.60	4
	7	3.65	5
	8	3.70	5
	9	3.75	6
	10	3.80	6
	11	3.90	7
	12	4.00	7
	13	4.25	9
	14	4.50	9
	15	4.80	10
	16	5.10	10
	17	5.40	13
	18	5.70	13
	19	6.00	14
	20	6.35	16
155 SOLID-CENTER MACHINE BITS			
	10" Twist, 1/2" Shank Cat. Page 8		
	Size, 16th		
	5	4.25	4
	6	4.25	4
	7	4.30	5
	8	4.35	6
	9	4.40	6
	10	4.45	7
	11	4.55	8
	12	4.65	9
	13	4.95	10
	14	5.30	10
	15	5.60	12
	16	5.95	12
	17	6.25	15
	18	6.65	16
155 SOLID-CENTER MACHINE BITS			
	12" Twist, 1/2" Shank Catalog Page 8		
	Size, 16th		
	6	4.75	5
	7	4.85	5
	8	4.95	6
	9	5.05	6
	10	5.15	8
	11	5.25	8
	12	5.35	10
	13	5.60	11
	14	6.00	12
	15	6.45	14
	16	6.80	15
	17	7.20	16
	18	7.60	17
	19	8.05	18
	20	8.35	20
155 SOLID-CENTER MACHINE BITS			
	14" Twist, 1/2" Shank Catalog Page 8		
	Size, 16th		
	9	5.40	8
	11	5.75	11
	13	6.40	12
	15	7.35	16
	17	8.35	21
157 SHIP-AUGER MACHINE BITS WITH SCREW 12" Twist, 1/2" Shank			
	Catalog Page 9		
	Size, 16th		
	6	4.80	4
	7	4.90	5
	8	5.00	7
	9	5.15	8
	10	5.25	9
	11	5.35	10
	12	5.45	13
	13	5.60	15
	14	6.00	16
	15	6.45	18
	16	6.80	20
	17	7.20	22

Cat. No.	DESCRIPTION	Price, Each	Weight, Ounces
157 SHIP-AUGER MACHINE BITS WITH SCREW 15" Twist, 1/2" Shank			
	Catalog Page 9		
	Size, 16th		
	18	9.00	24
	20	9.95	28
	22	10.95	32
	24	11.90	40
	28	14.25	56
	32	16.60	72
157 SHIP-AUGER MACHINE BITS WITH SCREW 18" Twist, 1/2" Shank			
	Catalog Page 9		
	Size, 16th		
	9	6.90	10
	10	7.10	11
	11	7.30	14
	12	7.50	16
	13	8.05	20
	14	8.65	21
	15	9.20	23
	16	9.80	24
	17	10.35	30
157 SHIP-AUGER MACHINE BITS WITH SCREW 24" Twist, 1/2" Shank			
	Catalog Page 9		
	Size, 16th		
	9	8.80	14
	10	9.00	15
	11	9.25	17
	12	9.50	21
	13	10.25	24
	14	11.00	27
	15	11.75	32
	16	12.40	35
	17	13.20	38
158 SHIP-AUGER MACHINE BITS WITHOUT SCREW			
	Catalog Page 9		
	Price On Application		
159 SINGLE-SPUR MACHINE BITS			
	12" Twist, 1/2" Shank Catalog Page 9		
	Size, 16th		
	6	4.80	4
	7	4.90	5
	8	5.00	7
	9	5.15	8
	10	5.25	9
	11	5.35	10
	12	5.45	13
	13	5.60	15
	14	6.00	16
	15	6.45	18
	16	6.80	20
	17	7.20	22
159 SINGLE-SPUR MACHINE BITS			
	18" Twist, 1/2" Shank Catalog Page 9		
	Size, 16th		
	9	6.90	10
	10	7.10	11
	11	7.30	14
	12	7.50	16
	13	8.05	20
	14	8.65	21
	15	9.20	23
	16	9.80	24
	17	10.35	30
159 SINGLE-SPUR MACHINE BITS			
	24" Twist, 1/2" Shank Catalog Page 9		
	Size, 16th		
	9	8.80	14
	10	9.00	15
	11	9.25	17
	12	9.50	21
	13	10.25	24
	14	11.00	27
	15	11.75	32
	16	12.40	35
	17	13.20	38



Fine Tools for Craftsmen

Cat. No.	DESCRIPTION	Price, Each	Weight, Ounces
161 & 162	SHORT DOUBLE-TWIST EXTENSION-LIP MACHINE BITS 2-1/4" Twist		
	No. 161 3/8" Shank		
	No. 162 1/2" Shank Cat. Page 10		
	Size, 16th		
	4	3.55	2
	5	3.55	2
	6	3.55	2
	7	3.60	2
	8	3.70	3
	9	3.80	3
	10	3.90	3
	11	3.95	3
	12	4.05	3
	13	4.30	4
	14	4.65	5
	15	4.95	5
	16	5.25	6
163	SCREW-SHANK DOWEL BITS		
	5/16" - 20 Thrd. Shank Cat. Page 10		
	Double-Thread Screw Point		
	Size, 16th		
	4	3.25	2
	5	3.35	2
	6	3.45	2
	7	3.50	2
	8	3.60	2
	9	3.70	3
	10	3.90	3
	12	4.05	4
	Single-Thread Screw Point		
	6	3.45	2
	7	3.50	2
	8	3.60	2
164	SCREW-SHANK DOWEL BITS		
	7/16" - 14 Thrd. Shank Cat. Page 10		
	Double-Thread Screw Point		
	Size, 16th		
	3	3.40	1
	4	3.25	2
	5	3.35	2
	6	3.45	2
	7	3.50	3
	8	3.60	3
	Single-Thread Screw Point		
	4	3.25	2
	5	3.35	2
	6	3.45	2
	7	3.50	3
	8	3.60	3
	9	3.70	3
	10	3.90	4
	12	4.05	5
169	MACHINE CENTER BITS		
	Catalog Page 7		
	Size, Inch		
	3/4	4.45	4
	7/8	4.65	4
	1	5.25	4
	1-1/8	6.45	5
	1-1/4	6.45	5
	1-3/8	7.60	6
	1-1/2	7.60	6
	1-3/4	8.75	6
	2	9.90	7
	2-1/4	11.00	8
	2-1/2	12.20	10
	2-3/4	13.35	12
	3	14.50	13
	3-1/4	16.25	15
	3-1/2	18.15	15
	4	21.10	17
174	STRAIGHT-SHANK TAPER-POINT DRILLS 2-1/2" Twist, 6" Over All		
	Catalog Page 15		
	Size, Inch		
	3/16	1.60	1
	13/64	1.60	1

(Continued Next Column)

7/32	1.60	1
15/64	1.60	1
1/4	1.60	1
17/64	1.70	1
9/32	1.70	2
5/16	1.80	2

174-A STRAIGHT-SHANK TAPER-POINT		
DRILLS 2" Twist, 4-1/2" Over All		
Catalog Page 15		
Size, Inch		
3/16	1.35	1
13/64	1.35	1
7/32	1.35	1
15/64	1.35	1
1/4	1.35	1
17/64	1.45	1
9/32	1.45	1
5/16	1.60	1

175 STRAIGHT-SHANK DRILLS		
2-1/2" Twist, 6" Over All		
Catalog Page 15		
Size, Inch		
1/8	1.20	1
5/32	1.20	1
11/64	1.30	1
3/16	1.30	1
13/64	1.30	1
7/32	1.30	1
15/64	1.30	1
1/4	1.30	1
17/64	1.45	1
9/32	1.45	2
5/16	1.50	2
11/32	1.60	2
3/8	1.70	3

175-A STRAIGHT-SHANK DRILLS		
2" Twist, 4-1/2" Over All		
Catalog Page 15		
Size, Inch		
1/8	1.00	1
5/32	1.00	1
11/64	1.10	1
3/16	1.10	1
13/64	1.10	1
7/32	1.10	1
15/64	1.10	1
1/4	1.10	1
17/64	1.20	1
9/32	1.20	1
5/16	1.30	1

176 TAPER-HEAD DRILLS		
4" Twist, 1/2" Shank Cat. Page 11		
Size, 32nd		
6	2.45	2
7	2.45	2
8	2.45	2
9	2.50	3
10	2.50	3
11	2.55	3
12	2.55	3
13	2.60	3
14	2.60	4
15	2.70	4
16	2.80	4
18	3.25	4
20	3.70	5
24	4.60	6

176 TAPER-HEAD DRILLS		
6" Twist, 1/2" Shank Cat. Page 11		
Size, 32nd		
12	3.15	4
14	3.30	4
16	3.45	4
18	3.85	5
20	4.40	6
22	4.90	7
24	5.50	8

Cat. No.	DESCRIPTION	Price, Each	Weight, Ounces
176	TAPER-HEAD DRILLS		
	8" Twist, 1/2" Shank Catalog Page 11		
	Size, 32nd		
	12	3.80	4
	14	3.95	5
	16	4.05	5
	18	4.50	6
	20	5.10	6
	22	5.70	8
	26	7.20	10
176	TAPER-HEAD DRILLS		
	10" Twist, 1/2" Shank Cat. Page 11		
	Size, 32nd		
	12	4.40	4
	14	4.60	5
	16	4.75	6
	18	5.15	7
	20	5.85	8
	22	6.55	9
	26	8.25	12
176	TAPER-HEAD DRILLS		
	12" Twist, 1/2" Shank Cat. Page 11		
	Size, 32nd		
	14	5.05	6
	16	5.40	7
	18	5.85	8
	20	6.60	9
	22	7.35	10
	26	9.30	12
	30	11.35	16
176-D	DOOR DOWEL DRILLS		
	High-Speed Steel Catalog Page 11		
	Size, 32nd		
	Right-Hand 16	6.10	5
	20	7.65	6
	Left-Hand 16	6.10	5
	20	7.65	6
177	SPUR MACHINE DRILLS		
	4" Twist, 1/2" Shank Cat. Page 11		
	Size, 32nd		
	6	2.65	2
	7	2.65	2
	8	2.65	2
	9	2.70	3
	10	2.70	3
	11	2.75	3
	12	2.75	3
	13	2.80	3
	14	2.80	4
	15	2.90	4
	16	3.00	4
	18	3.45	4
	20	3.95	5
	22	4.40	5
	24	5.00	6
	26	5.55	6
	28	6.15	7
	30	6.80	8
	32	7.55	9
	36	9.00	12
	40	10.60	16
177-A	SPUR MACHINE DRILLS		
	2-1/2" Twist, 1/2" Shank Cat. Page 11		
	Size, 32nd		
	12	2.75	3
	14	2.80	3
	16	3.00	4
177-M	SPUR MACHINE DRILLS		
	Taper Shank Catalog Page 11		
	Size, 32nd		
	Right-Hand 12	3.70	2
	14	3.90	2
	16	4.15	3
	Left-Hand 12	3.70	2
	14	3.90	2
	16	4.15	3

Cat. No.	DESCRIPTION	Price, Each	Weight, Ounces
177-S	STRAIGHT-SHANK MACHINE		
	DRILLS Spur-Cut, 2-1/2" Twist,		
	6" Over All Catalog Page 15		
	Size, Inch		
	3/16	1.90	1
	7/32	1.90	1
	1/4	1.90	1
178	SCREW-SHANK DOWEL DRILLS		
	5/16" - 20 Thrd. Shank Cat. Page 10		
	Size, 32nd		
	6	3.25	1
	8	3.25	2
	10	3.35	2
	12	3.45	2
	14	3.70	2
	16	3.95	2
	18	4.40	3
	20	4.90	3
	24	5.80	4
178-A	SCREW-SHANK DOWEL DRILLS		
	7/16" - 14 Thrd. Shank Cat. Page 10		
	Size, 32nd		
	6	3.25	1
	8	3.25	2
	10	3.35	2
	12	3.45	2
	14	3.70	3
	16	3.95	3
	18	4.40	3
	20	4.90	4
	24	5.80	5
179	SCREW-SHANK DOWEL DRILLS		
	5/16" - 20 Thrd. Shank Cat. Page 10		
	Size, 32nd		
	6	3.35	1
	8	3.35	2
	10	3.50	2
	12	3.65	2
	14	3.80	2
	16	4.05	2
	18	4.50	3
	20	5.00	3
	24	5.95	4
179-A	SCREW-SHANK DOWEL DRILLS		
	7/16" - 14 Thrd. Shank Cat. Page 10		
	Size, 32nd		
	Right-Hand 6	3.35	1
	8	3.35	2
	10	3.50	2
	12	3.65	2
	14	3.80	3
	16	4.05	3
	18	4.50	3
	20	5.00	4
	24	5.95	5
	Left-Hand 12	3.65	2
	14	3.80	2
	16	4.05	3
179-M	SCREW-SHANK DOWEL DRILLS		
	5/16" - 18 Thrd. Shank Cat. Page 10		
	Size, 32nd		
	Right-Hand 12	3.65	2
	14	3.80	2
	16	4.05	2
	Left-Hand 12	3.65	2
	14	3.80	2
	16	4.05	2
180	COUNTERSINK MACHINE BITS		
	Catalog Page 13		
	Price On Application		
183	COUNTERSINK BITS AND DRILLS		
	Catalog Page 13		
	Price On Application		



Fine Tools for Craftsmen

Cat. No.	DESCRIPTION	Price, Each	Weight, Ounces
184	MULTI-SPUR COUNTERSINK CUTTERS Catalog Page 14		
	Size, Inch		
	1-1/8	9.00	2
	1-1/4	9.60	3
	1-3/8	10.25	3
	1-1/2	11.20	4
	1-5/8	12.00	5
	1-3/4	12.90	5
	1-7/8	13.50	6
	2	13.95	7
	2-1/8	14.35	8
	2-1/4	15.25	9
	2-1/2	17.60	11
185	TAPER-CUT COUNTERSINK DRILLS Catalog Page 13		
	Size, Inch		
	3/16 x 1/2	6.60	3
	7/32 x 1/2	6.60	3
	1/4 x 1/2	6.60	3
186	SPUR-CUT COUNTERSINK DRILLS Catalog Page 13		
	Size, Inch		
	3/16 x 1/2	7.40	3
	7/32 x 1/2	7.40	3
	1/4 x 1/2	7.40	3
189	COUNTERBORE MACHINE BITS Catalog Page 13 Price On Application		
191	ADJUSTABLE COUNTERSINK CUTTERS Bevel-Cut Cat. Page 14		
	Size, Inch Bore, Inch		
	1/2 1/8	3.30	1
	1/2 5/32	3.30	1
	1/2 11/64	3.30	1
	1/2 3/16	3.30	1
	1/2 13/64	3.30	1
	1/2 7/32	3.30	1
	1/2 15/64	3.30	1
	1/2 1/4	3.30	1
	5/8 1/4	3.70	2
	5/8 17/64	3.70	2
	5/8 9/32	3.70	2
	5/8 5/16	3.70	2
	3/4 5/16	4.15	2
	3/4 3/8	4.15	2
192	ADJUSTABLE COUNTERSINK CUTTERS Spur-Cut Catalog Page 14		
	Size, Inch Bore, Inch		
	1/2 1/8	5.20	1
	1/2 5/32	5.20	1
	1/2 11/64	5.20	1
	1/2 3/16	5.20	1
	1/2 13/64	5.20	1
	1/2 7/32	5.20	1
	1/2 15/64	5.20	1
	1/2 1/4	5.20	1
	5/8 1/4	5.60	2
	5/8 17/64	5.60	2
	5/8 9/32	5.60	2
	3/4 5/16	6.10	2
195	ADJUSTABLE COUNTERSINKS Spur-Cut, 1/2" Shank Cat. Page 14		
	Size, Inch Bore, Inch		
	3/8 3/16	6.95	2
	7/16 5/32	6.95	2
	7/16 3/16	6.95	2
	1/2 1/8	6.95	3
	1/2 11/64	6.95	3
	1/2 3/16	6.95	3
	1/2 13/64	6.95	3
	1/2 7/32	6.95	3
	1/2 15/64	6.95	3
	1/2 1/4	6.95	2

(Continued Next Column)

Cat. No.	DESCRIPTION	Price, Each	Weight, Ounces
	9/16 7/32	7.35	2
	9/16 1/4	7.35	3
	5/8 3/16	7.80	3
	5/8 7/32	7.80	3
	5/8 1/4	7.80	3
	5/8 17/64	7.80	3
	5/8 9/32	7.80	3
	5/8 5/16	7.80	3
	3/4 1/4	9.55	3
	3/4 9/32	9.55	3
	3/4 5/16	9.55	3
	3/4 3/8	9.55	3
	7/8 1/4	10.85	4
	7/8 9/32	10.85	3
	7/8 5/16	10.85	3
	7/8 11/32	10.85	3
	7/8 3/8	10.85	3
	1 1/4	12.15	4
	1 9/32	12.15	4
	1 5/16	12.15	4
	1 11/32	12.15	4
	1 3/8	12.15	4
	1-1/8 5/16	13.45	5
	1-1/8 11/32	13.45	5
	1-1/8 3/8	13.45	4
	1-1/4 5/16	14.80	6
	1-1/4 11/32	14.80	5
	1-1/4 3/8	14.80	6
198	ADJUSTABLE COUNTERSINKS Bevel-Cut, 1/2" Shank Catalog Page 15		
	Size, Inch Bore, Inch		
	1/2 1/8	4.95	2
	1/2 5/32	4.95	2
	1/2 11/64	4.95	2
	1/2 3/16	4.95	2
	1/2 13/64	4.95	2
	1/2 7/32	4.95	2
	1/2 15/64	4.95	2
	1/2 1/4	4.95	2
	5/8 1/4	5.80	3
	5/8 17/64	5.80	3
	5/8 9/32	5.80	3
	5/8 5/16	5.80	3
	3/4 5/16	7.45	4
	3/4 3/8	7.45	4
199	ADJUSTABLE COUNTERSINKS Bevel-Cut, 1/2" Shank Catalog Page 15		
	Size, Inch Bore, Inch		
	1/2 3/16	6.30	2
	1/2 7/32	6.30	2
	1/2 1/4	6.30	2
720	HOLLOW CHISEL SHARPENING MACHINE Catalog Page 5 Price On Application		
111	DOUBLE-ANGLE CUTTERS Catalog Page 5 Price On Application		
115-116-117	BIT AND CHISEL BUSHINGS Catalog Page 5 Price On Application		
1150	SHEATHING CUTTER 2-1/2", complete 36.45 30 Catalog Page 12		
	SH1 Body	12.60	19 1/2
	SH2 Bit Pilot	3.60	5 1/2
	SH3 Outside Cut Spurs (3 Required)	5.75	1/2
	SH4 Inside Cut Spurs (1 Required)	5.75	1/2
	SH5 Cutter Lock Screws (4 Required)	.20	1
	SH6 Stop Screws (2 Required)	.20	1
	SH7 Set Screw	.20	1
	SH8 Wrench	.20	1
1665	SIDING BAR	4.40	32