

GREENLEE TOOLS

*For Mortising
And Boring*



Catalog 28

GREENLEE BROS. & CO.

Rockford, Ill., U.S.A.



GREENLEE

Mortising and Boring TOOLS

HOLLOW CHISELS, HOLLOW CHISEL
BITS, MACHINE BITS, MORTISING
CHISELS, ROUTING BITS, WOOD
BORING DRILLS, COUNTERSINKS,
RELISHING BITS, CENTER BITS AND
OTHER TYPES FOR MACHINE USE.

Catalog No. 28
1927



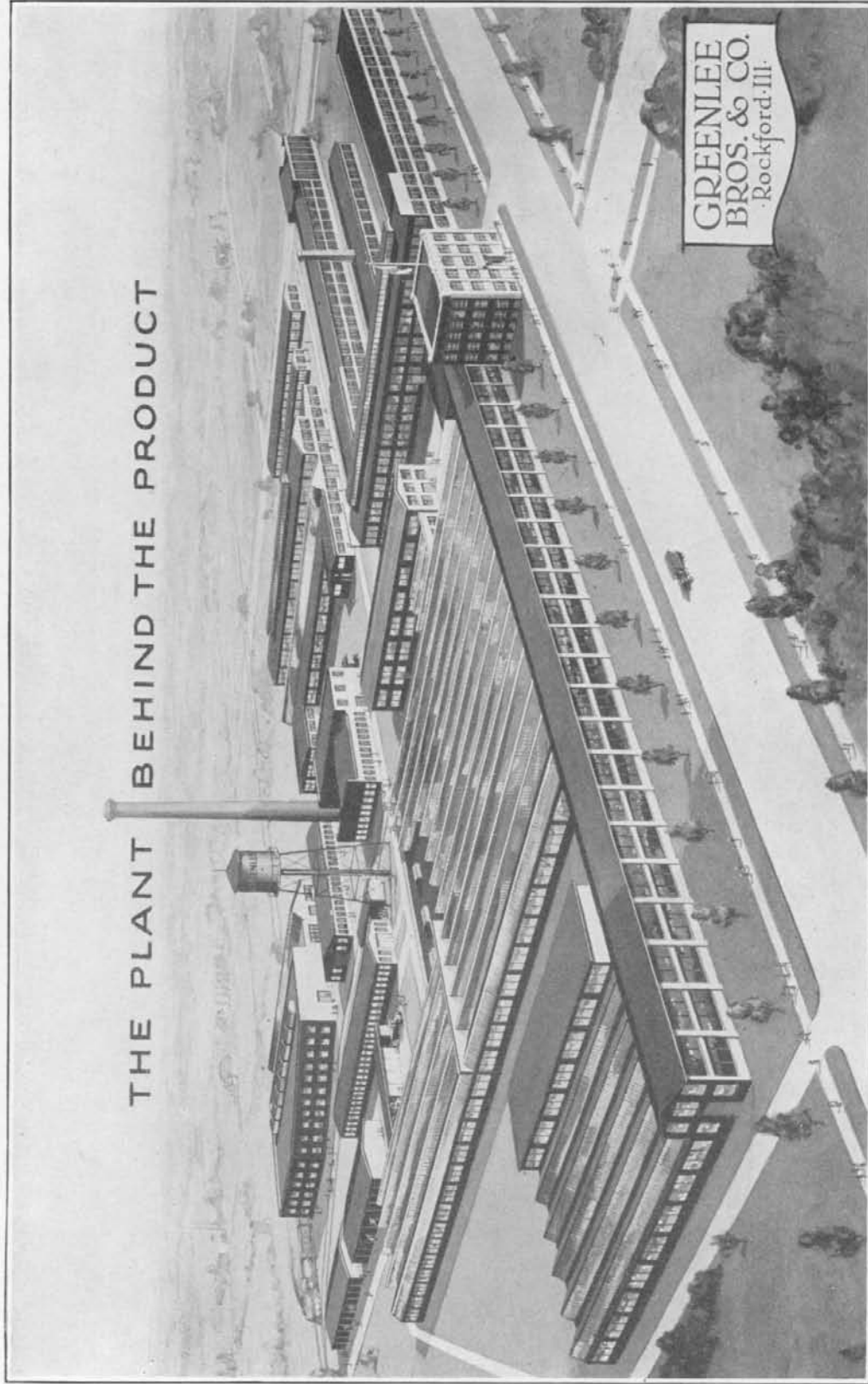
GREENLEE BROS. & CO.

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THE PLANT BEHIND THE PRODUCT



GREENLEE
BROS. & CO.
Rockford, Ill.



To the Customer

THIS Catalog shows all the essential items in our line of Mortising and Boring Tools for machine use. We make almost every form of tool practical for either boring, mortising, or routing, and if customer has any requirement not covered by the standard lines here shown we will be pleased to discuss the matter further with him.

For more than fifty years we have been building machines for boring and mortising wood and during this period we have developed and produced Mortising and Boring tools which are known by the users as being of the highest quality possible. We have an experimental department in connection with the manufacture of our tools and machinery where we are in position to solve all difficult woodworking problems, this department being at your service as is also the assistance of our engineering force.

We endeavor to describe and list our tools so that customers can easily refer to type numbers, sizes or code word when ordering. We urge customers to make their orders very definite because, while we use care in executing each, our business involves making several thousand tools daily in hundreds of sizes and types.

Prices and discounts are subject to change without notice, although we aim to notify all regular customers if such change should be an advance. Terms are net cash, thirty days from date of invoice, to customers with adequate rating or with suitable references. Otherwise, if parties are unknown to us, we forward goods C. O. D. with charges added for return of money.

All orders are formally acknowledged and detailed packing list is enclosed with shipment. Any shortage or error must be reported on receipt of goods. We are not responsible for loss or damage in transit but will prosecute express or freight claims in behalf of our customers. On parcel post shipments we insure and add charges to invoice unless advised definitely that customer will assume all risk of loss in the mails.



Hollow Chisel Mortising Tools

THE Hollow Chisel Mortiser is absolutely an economical type of machine but results depend first on the type, mechanism and condition of the machine and then on both the chisel and the bit used. Chisels and bits will not give good service if the machine is not in first class condition. Chisels will not stand up if used with bits not suitable for them. Greenlee Hollow Chisels and their Bits will give greatest economy if used together, either in a Greenlee or any other make of mortiser.

To get results it is first necessary to have the right type of machine and keep it in condition. Next, the chisel must be sharp and with proper form of cutting edges. For sharpening hollow chisels we refer you to pages 66 and 67 which show and describe our new machine for this purpose.

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. Always file the cutting edges of a bit from below, with the file working in the throat through which the chips would pass. The side lips and spurs should be sharp and lined up evenly with the cutting edges.

A correct adjustment between bit and chisel when placed in the machine is of prime importance. A common method is to place the chisel in the socket with a slight clearance between its shoulder and face of chisel socket, fastening lightly. The bit is then inserted until its head rests on the cutting edge of the chisel and is securely fastened in this position. When the chisel is pushed back so that its shoulder rests against the face of the chisel socket, the proper clearance will be allowed.

The Hollow Chisel is by far the more expensive of the two tools, costing about four times as much as the bit. It is not economy to use bits that are not in first class condition as by so doing a greater strain is thrown on the chisel, with a breakage liable to result. Replace the bits when there is any question whatever of their doing their full share of the work.

We manufacture hollow chisels and hollow chisel bits of Regular Types for use in all makes of machines, and in ordering MAKE and STYLE NUMBER should be carefully noted.



Comparison of Regular and Hard-Wear Types

ON THE following pages we show two types of Hollow Chisels and Hollow Chisel Bits. The Regular type has been in use for about fifty years, being designed originally at a time when it was not considered practical to mortise in any of the harder woods or woods difficult to machine. Naturally the quality has been improved in late years but no material change has been made until recently when we brought out our new Hard-Wear Hollow Chisels and Bits.

The Hard-Wear Hollow Chisel is made with double openings for quick relief of the chips. One opening is near the shank end of the blade while the extra opening is on opposite side nearer the cutting edges, allowing chips to be thrown out quicker with less tendency of extreme heating and clogging.

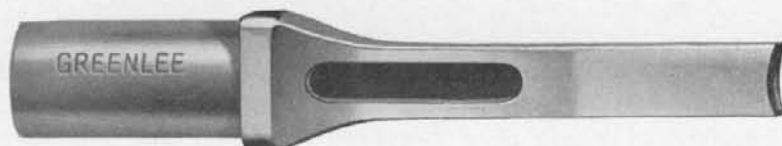
The Regular Hollow Chisel has a single opening in the blade for the discharge of chips. This allows wearing the chisel back further by sharpening where the work is not severe and where heating and clogging of chips does not occur.

Hollow Chisel Bits of the Hard-Wear type have broad-faced cutting spurs actually removing the stock instead of severing and spreading the wood fibres. Friction heat will be absorbed and spurs will not turn over. The brad point centers the bit eliminating the tendency of crowding over against one side of chisel. Cutting edges have a slight droop, making a shearing cut and producing well broken chips.

Regular Hollow Chisel Bits are made without point, this being unnecessary in the general run of commercial woods. Cutting edges are square across and cutting spurs are of the knife-edged style. This type of bit is the one more familiar to the average user and is easily sharpened and kept in condition.

Whether you use Regular type or Hard-Wear type of hollow chisels and bits, be sure that machine is in first class operating condition. The bit spindle belt must not slip, avoid contact between bit and chisel at the cutting edges, and tools should be kept sharp. Another contributing cause of trouble is worn and defective bushings, and these should be replaced if there is any question of their not being correct in all respects.

If any difficulty in mortising is encountered we offer you the service of our engineering department which is equipped with mortisers for experimental work.



No. 102-B Regular Hollow Chisel

2 $\frac{3}{4}$ -INCH BLADE

HOLLOW Chisels of the Regular type having 2 $\frac{3}{4}$ -inch blade are made with one opening for the clearance of chips as compared with two openings in the Hard-Wear type chisels. This length of blade requires No. 121-B or No. 121-H Hollow Chisel Bits having a 4 $\frac{3}{4}$ -inch twist, 8-inch overall length.

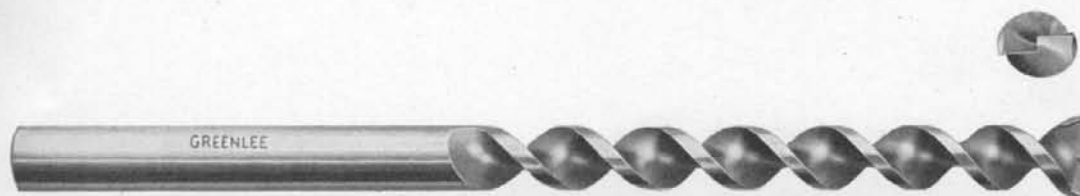
The Regular Hollow Chisels are recommended for use in soft or pitchy woods. When mortising in any of the harder woods better working results will be obtained when using the Hard-Wear chisel. This type is shown on page 8 and on page 5 we give a comparison between the two.

When ordering, specify type desired and advise MAKE and STYLE NUMBER of machine in which they are to be used.

Sizes as listed below carried in stock.

LIST PRICE EACH

Size	Price	Shank	Mortise	Code
$\frac{1}{4}$ "x $\frac{1}{4}$ "	\$3.50	$\frac{5}{8}$ "x1 $\frac{1}{2}$ "	1 $\frac{7}{8}$ " deep	SACKAGE
$\frac{5}{16}$ "x $\frac{5}{16}$ "	3.50	$\frac{5}{8}$ "x1 $\frac{1}{2}$ "	1 $\frac{7}{8}$ " deep	SACKBUT
$\frac{3}{8}$ "x $\frac{3}{8}$ "	3.50	$\frac{5}{8}$ "x1 $\frac{1}{2}$ "	1 $\frac{7}{8}$ " deep	SACKFUL



No. 121-B Regular Hollow Chisel Bit

4 $\frac{3}{4}$ -INCH TWIST—8-INCH OVERALL

THE No. 121-B Hollow Chisel Bits are for use in hollow chisels having 2 $\frac{3}{4}$ -inch blade Nos. 102-B or 102-H. The Regular type bits are made with knife edged cutting spurs, without point, have 4 $\frac{3}{4}$ -inch twist with overall dimension of 8 inches.

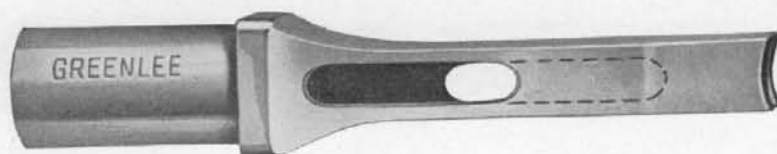
We recommend the Regular type bits for use in any of the softer woods, also wherever the work requires that partial cuts be made. For use in any of the harder woods and whenever partial cuts can be avoided the Hard-Wear type should be used.

Similar Bits of the Hard-Wear type are shown on page 9, while comparison is made on page 5. Orders should designate which type is preferred and MAKE and STYLE NUMBER of machine should be specified.

Listed sizes carried in stock.

LIST PRICE EACH

Size	Price	Shank	Code
1/4"	\$1.20	3/16" x 3 1/4"	SACKING
5/16"	1.20	1/4" x 3 1/4"	SACKLESS
3/8"	1.20	19/64" x 3 1/4"	SACKRACE



No. 102-H Hard-Wear Hollow Chisel

2 $\frac{3}{4}$ -INCH BLADE

Patented Dec. 27, 1921

THE No. 102-H Hard-Wear Hollow Chisels have 2 $\frac{3}{4}$ -inch long straight blade and require either our No. 121-B or No. 121-H Hollow Chisel Bits with 4 $\frac{3}{4}$ -inch twist and 8-inch overall length.

These short chisels are without re-enforced section of blade and will mortise 1 $\frac{7}{8}$ -inches deep. The $\frac{1}{4}$ and $\frac{5}{16}$ -inch sizes of our 4-inch blade chisels are of re-enforced type and will mortise only to the same depth.

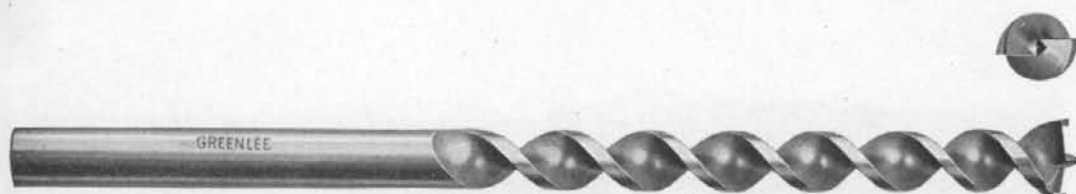
The Hard-Wear chisels are made with two openings, one near shoulder, the other on opposite side close to cutting edge. This gives quicker chip relief, reduces heating, prevents clogging, and eases the strain on the twist of the bit.

Similar chisels of the Regular type are shown on page 6 and a comparison is made on page 5. Specify type desired and state MAKE and STYLE NUMBER of your machine.

Listed sizes carried in stock.

LIST PRICE EACH

Size	Price	Shank	Mortise	Code
$\frac{1}{4}$ " x $\frac{1}{4}$ "	\$3.50	$\frac{5}{8}$ " x 1 $\frac{1}{2}$ "	1 $\frac{7}{8}$ " deep	SAMARA
$\frac{5}{16}$ " x $\frac{5}{16}$ "	3.50	$\frac{5}{8}$ " x 1 $\frac{1}{2}$ "	1 $\frac{7}{8}$ " deep	SAMBAR
$\frac{3}{8}$ " x $\frac{3}{8}$ "	3.50	$\frac{5}{8}$ " x 1 $\frac{1}{2}$ "	1 $\frac{7}{8}$ " deep	SAMBO



No. 121-H Hard-Wear Hollow Chisel Bit

4 $\frac{3}{4}$ -INCH TWIST—8-INCH OVERALL

Patented Dec. 27, 1921

OUR No. 121-H Hard-Wear Hollow Chisel Bits have cutting spurs of a new style which actually remove the stock thereby reducing friction heat. The brad point will properly center the bit and is most desirable, except when partial cuts are being made.

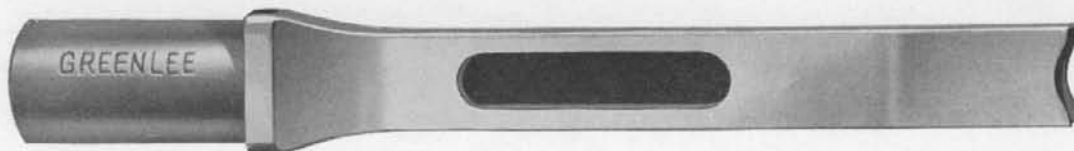
The No. 121-H and the No. 121-B Bits may be used interchangeably in the 2 $\frac{3}{4}$ -inch blade Hollow Chisels, Nos. 102-H and 102-B. We recommend, however, the Regular type bits for soft woods and the Hard-Wear type bits when mortising the harder woods.

On page 7 we show similar bits in our Regular pattern and comparison is made on page 5. Type desired should be clearly specified in ordering and information given as to MAKE and STYLE NUMBER of your machine.

Listed sizes carried in stock.

LIST PRICE EACH

Size	Price	Shank	Code
$\frac{1}{4}$ "	\$1.20	$\frac{3}{16}$ " x 3 $\frac{1}{4}$ "	SAMBUCENE
$\frac{5}{16}$ "	1.20	$\frac{1}{4}$ " x 3 $\frac{1}{4}$ "	SAMBUCUS
$\frac{3}{8}$ "	1.20	$\frac{19}{64}$ " x 3 $\frac{1}{4}$ "	SAMBUK



No. 101-B Regular Hollow Chisel

4-INCH BLADE

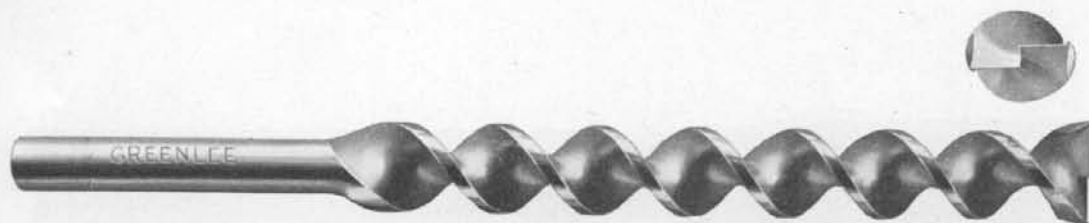
NO. 101-B Hollow Chisels have one opening for relief of chips. This is the only length of blade in which we carry oblong sizes. We always make $\frac{1}{4}$ -inch and $\frac{5}{16}$ -inch with re-enforced blade for mortising $1\frac{7}{8}$ inches deep, the $\frac{3}{8}$ -inch size can be supplied with either straight or re-enforced blade.

On page 12 we show our Hard-Wear type, a comparison being made on page 5. Either No. 120-B or No. 120-H bits can be used in these chisels. Always specify type desired and advise MAKE and STYLE NUMBER of your machine.

Listed sizes in stock.

LIST PRICE EACH

Size	Price	Shank	Mortise	Code
$\frac{1}{4}$ " x $\frac{1}{4}$ "	\$4.40	$\frac{5}{8}$ " x $1\frac{1}{2}$ "	$1\frac{7}{8}$ " deep	SABAEAN
$\frac{5}{16}$ " x $\frac{5}{16}$ "	4.40	$\frac{5}{8}$ " x $1\frac{1}{2}$ "	$1\frac{7}{8}$ " deep	SABAOOTH
$\frac{3}{8}$ " x $\frac{3}{8}$ "	4.40	$\frac{5}{8}$ " x $1\frac{1}{2}$ "	$3\frac{1}{4}$ " deep	SABAZIA
$\frac{3}{8}$ " x $\frac{7}{16}$ "	4.95	$\frac{5}{8}$ " x $1\frac{1}{2}$ "	$3\frac{1}{4}$ " deep	SACCADE
$\frac{3}{8}$ " x $\frac{1}{2}$ "	5.15	$\frac{5}{8}$ " x $1\frac{1}{2}$ "	$3\frac{1}{4}$ " deep	SACCATAE
$\frac{3}{8}$ " x $\frac{9}{16}$ "	5.40	$\frac{5}{8}$ " x $1\frac{1}{2}$ "	$3\frac{1}{4}$ " deep	SACCATO
$\frac{7}{16}$ " x $\frac{7}{16}$ "	4.80	$\frac{5}{8}$ " x $1\frac{1}{2}$ "	$3\frac{1}{4}$ " deep	SABBADAY
$\frac{7}{16}$ " x $\frac{1}{2}$ "	5.40	$\frac{5}{8}$ " x $1\frac{1}{2}$ "	$3\frac{1}{4}$ " deep	SACCHARIC
$\frac{1}{2}$ " x $\frac{1}{2}$ "	5.25	$\frac{5}{8}$ " x $1\frac{1}{2}$ "	$3\frac{1}{4}$ " deep	SABBATH
$\frac{1}{2}$ " x $\frac{5}{8}$ "	6.00	$\frac{5}{8}$ " x $1\frac{1}{2}$ "	$3\frac{1}{4}$ " deep	SACCULAR
$\frac{1}{2}$ " x $\frac{3}{4}$ "	6.40	$\frac{5}{8}$ " x $1\frac{1}{2}$ "	$3\frac{1}{4}$ " deep	SACCULUS
$\frac{9}{16}$ " x $\frac{9}{16}$ "	5.65	$\frac{3}{4}$ " x $1\frac{1}{2}$ "	$3\frac{1}{4}$ " deep	SABBATIA
$\frac{5}{8}$ " x $\frac{5}{8}$ "	6.05	$\frac{3}{4}$ " x $1\frac{1}{2}$ "	$3\frac{1}{4}$ " deep	SABBATON
$\frac{11}{16}$ " x $\frac{11}{16}$ "	6.50	$\frac{3}{4}$ " x $1\frac{1}{2}$ "	$3\frac{1}{4}$ " deep	SABETIM
$\frac{3}{4}$ " x $\frac{3}{4}$ "	6.90	$1\frac{1}{8}$ " x $1\frac{1}{2}$ "	3" deep	SABELINE
$\frac{13}{16}$ " x $\frac{13}{16}$ "	7.35	$1\frac{1}{8}$ " x $1\frac{1}{2}$ "	3" deep	SABELLA
$\frac{7}{8}$ " x $\frac{7}{8}$ "	7.80	$1\frac{1}{8}$ " x $1\frac{1}{2}$ "	3" deep	SABELOR



No. 120-B Regular Hollow Chisel Bit

6-INCH TWIST—9-INCH OVERALL

REGULAR Hollow Chisel Bits No. 120-B have 6-inch twist, 9-inch overall length except on $\frac{1}{4}$ and $\frac{5}{16}$ -inch sizes which have $3\frac{1}{4}$ -inch twist, 9-inch overall length, the twist terminating at the center of the openings in the reinforced section of the chisel.

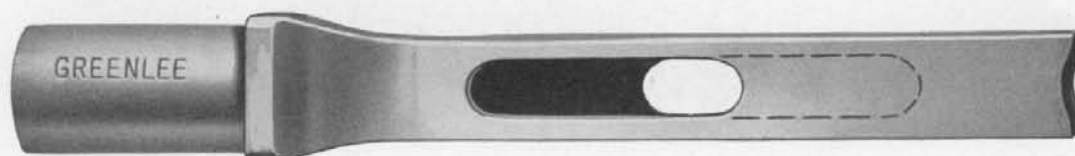
These Bits have knife edged spurs, without point, and should be used where it is necessary to make partial cuts, also recommended for use in soft wood. Page 13 illustrates the Hard-Wear type of same dimensions for hard wood.

In ordering note type desired and state MAKE and STYLE NUMBER of machine in which they are to be used.

Listed sizes carried in stock.

LIST PRICE EACH

Size	Price	Shank	Code
$\frac{1}{4}$ "	\$1.20	$\frac{3}{16}$ " x $5\frac{3}{4}$ "	SABERED
$\frac{5}{16}$ "	1.20	$\frac{1}{4}$ " x $5\frac{3}{4}$ "	SABINES
$\frac{3}{8}$ "	1.20	$\frac{19}{64}$ " x 3"	SABLEIZE
$\frac{7}{16}$ "	1.20	$\frac{19}{64}$ " x 3"	SABLIERE
$\frac{1}{2}$ "	1.20	$\frac{19}{64}$ " x 3"	SABOTIER
$\frac{9}{16}$ "	1.35	$\frac{19}{64}$ " x 3"	SABRINA
$\frac{5}{8}$ "	1.50	$\frac{19}{64}$ " or $\frac{1}{2}$ " x 3"	SABULOSE
$\frac{11}{16}$ "	1.70	$\frac{19}{64}$ " or $\frac{1}{2}$ " x 3"	SABULOUS
$\frac{3}{4}$ "	1.80	$\frac{19}{64}$ " or $\frac{1}{2}$ " x 3"	SABULIN
$\frac{13}{16}$ "	1.95	$\frac{19}{64}$ " or $\frac{1}{2}$ " x 3"	SABURRA
$\frac{7}{8}$ "	2.20	$\frac{19}{64}$ " or $\frac{1}{2}$ " x 3"	SABURTO



No. 101-H Hard-Wear Hollow Chisel

4-INCH BLADE

Patented Dec. 27, 1921

THE No. 101-H Hard-Wear Hollow Chisels have straight blade 4 inches long to mortise about 3 inches deep, except on the $\frac{1}{4}$ and $\frac{5}{16}$ -inch sizes which are of the re-enforced type to mortise only $1\frac{7}{8}$ inches deep.

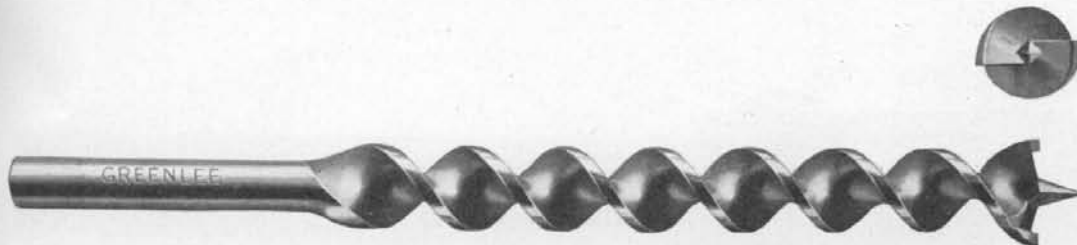
The Hard-Wear Chisels are made with two openings—one near shoulder, the other on opposite side near cutting edges giving quicker chip relief. In difficult mortising this reduces heating and prevents clogging. For comparison with Regular type see page 5.

For use in these chisels we show our No. 120-H on opposite page and on page 11 we show our No. 120-B which may be used according to the class of work for which they are intended. Specify Hard-Wear type for the hard woods and Regular type for the soft woods. In ordering give information as to MAKE and STYLE NUMBER of your machine.

Listed sizes carried in stock.

LIST PRICE EACH

Size	Price	Shank	Mortise	Code
$\frac{1}{4}$ " x $\frac{1}{4}$ "	\$4.40	$\frac{5}{8}$ " x $1\frac{1}{2}$ "	$1\frac{7}{8}$ " deep	SAMENESS
$\frac{5}{16}$ " x $\frac{5}{16}$ "	4.40	$\frac{5}{8}$ " x $1\frac{1}{2}$ "	$1\frac{7}{8}$ " deep	SAMIAN
$\frac{3}{8}$ " x $\frac{3}{8}$ "	4.40	$\frac{5}{8}$ " x $1\frac{1}{2}$ "	$3\frac{1}{4}$ " deep	SAMIEL
$\frac{7}{16}$ " x $\frac{7}{16}$ "	4.80	$\frac{5}{8}$ " x $1\frac{1}{2}$ "	$3\frac{1}{4}$ " deep	SAMISEN
$\frac{1}{2}$ " x $\frac{1}{2}$ "	5.25	$\frac{5}{8}$ " x $1\frac{1}{2}$ "	$3\frac{1}{4}$ " deep	SAMITE
$\frac{9}{16}$ " x $\frac{9}{16}$ "	5.65	$\frac{3}{4}$ " x $1\frac{1}{2}$ "	$3\frac{1}{4}$ " deep	SAMLET
$\frac{5}{8}$ " x $\frac{5}{8}$ "	6.05	$\frac{3}{4}$ " x $1\frac{1}{2}$ "	$3\frac{1}{4}$ " deep	SAMOVAR
$\frac{3}{4}$ " x $\frac{3}{4}$ "	6.90	$1\frac{1}{8}$ " x $1\frac{1}{2}$ "	3" deep	SAMPHIRE
$\frac{7}{8}$ " x $\frac{7}{8}$ "	7.80	$1\frac{1}{8}$ " x $1\frac{1}{2}$ "	3" deep	SAMOUN



No. 120-H Hard-Wear Hollow Chisel Bit

6-INCH TWIST—9-INCH OVERALL

Patented Dec. 27, 1921

OUR No. 120-H Hard-Wear Hollow Chisel Bits have 6-inch twist 9-inch overall length except on the $\frac{1}{4}$ and $\frac{5}{16}$ -inch sizes which have $3\frac{1}{4}$ -inch twist 9-inch overall length, the twist terminating at the center of the openings in the re-enforced section of the chisel.

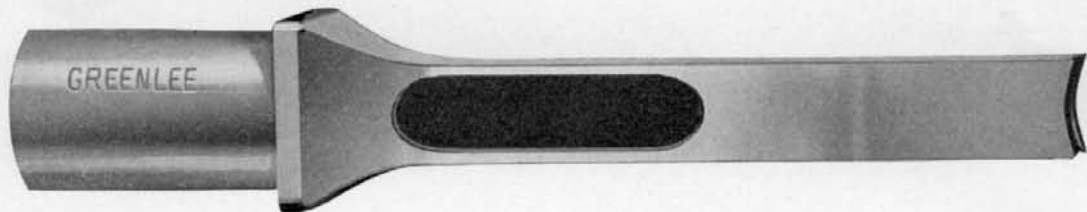
This type has broad faced cutting spurs which actually remove the stock instead of acting as a wedge. The brad point properly centers the bit and acts as a lead to hold bit in proper position in chisel.

No. 120-H Bits or No. 120-B as illustrated on page 11 can be used interchangeably in No. 101-B or No. 101-H Hollow Chisels as the bore in the chisels is the same. Specify type desired and state MAKE and STYLE NUMBER of machine in which they are to be used.

Listed sizes carried in stock.

LIST PRICE EACH

Size	Price	Shank	Code
$\frac{1}{4}$ "	\$1.20	$\frac{3}{16}$ " x $5\frac{3}{4}$ "	SAMACHIAS
$\frac{5}{16}$ "	1.20	$\frac{1}{4}$ " x $5\frac{3}{4}$ "	SAMADH
$\frac{3}{8}$ "	1.20	$\frac{19}{64}$ " x 3"	SAMAJ
$\frac{7}{16}$ "	1.20	$\frac{19}{64}$ " x 3"	SAMAIAS
$\frac{1}{2}$ "	1.20	$\frac{19}{64}$ " x 3"	SAMANA
$\frac{9}{16}$ "	1.35	$\frac{19}{64}$ " x 3"	SAMANCO
$\frac{5}{8}$ "	1.50	$\frac{1}{2}$ " x 3"	SAMAOTH
$\frac{3}{4}$ "	1.80	$\frac{1}{2}$ " x 3"	SAMARANG
$\frac{7}{8}$ "	2.20	$\frac{1}{2}$ " x 3"	SAMARATH



No. 103-B Regular Hollow Chisel

5-INCH BLADE

HOLLOW Chisels having 5-inch blade No. 103-B are carried in stock to take care of requirements where a 4-inch blade does not give the desired depth of mortising. Chisels carried in stock of this length have minimum shank diameter of $1\frac{1}{8}$ inches and cannot be used in machines having chisel sockets of smaller diameter.

Regular type of chisels have one opening for chip relief and all sizes are made with straight blade. Hard-Wear type chisels of this length are shown on page 16 and comparison of the two is made on page 5.

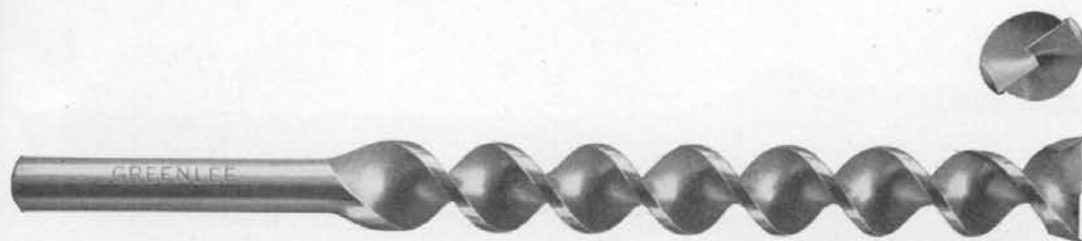
Chisels having 5-inch blade require bits with 7-inch twist 10-inch overall length either our No. 122-B or No. 122-H illustrated on pages 15 and 17 respectively.

In ordering specify MAKE and STYLE NUMBER of machine in which they are to be used.

Listed sizes carried in stock.

LIST PRICE EACH

Size	Price	Shank	Mortise	Code
$\frac{3}{8}$ "	\$5.80	$1\frac{1}{8}$ "x $1\frac{3}{4}$ "	$3\frac{3}{4}$ " deep	SADDENED
$\frac{7}{16}$ "	6.20	$1\frac{1}{8}$ "x $1\frac{3}{4}$ "	$3\frac{3}{4}$ " deep	SADDENS
$\frac{1}{2}$ "	6.60	$1\frac{1}{8}$ "x $1\frac{3}{4}$ "	$3\frac{3}{4}$ " deep	SADDLED
$\frac{9}{16}$ "	7.05	$1\frac{1}{8}$ "x $1\frac{3}{4}$ "	$3\frac{3}{4}$ " deep	SADDLERY
$\frac{5}{8}$ "	7.45	$1\frac{1}{8}$ "x $1\frac{3}{4}$ "	$3\frac{3}{4}$ " deep	SADDUCEE
$\frac{3}{4}$ "	8.25	$1\frac{1}{8}$ "x $1\frac{3}{4}$ "	$3\frac{3}{4}$ " deep	SADDUCIZE
$\frac{7}{8}$ "	9.10	$1\frac{3}{8}$ "x $1\frac{3}{4}$ "	$3\frac{3}{4}$ " deep	SADNESS
1"	9.90	$1\frac{3}{8}$ "x $1\frac{3}{4}$ "	$3\frac{3}{4}$ " deep	SAFFIRE
$1\frac{1}{8}$ "	10.75	$1\frac{3}{8}$ "x $1\frac{3}{4}$ "	$3\frac{3}{4}$ " deep	SAGGER
$1\frac{1}{4}$ "	11.60	$1\frac{3}{8}$ "x $1\frac{3}{4}$ "	$3\frac{3}{4}$ " deep	SAFFRON



No. 122-B Regular Hollow Chisel Bit

7-INCH TWIST—10-INCH OVERALL

NO. 122-B Regular Hollow Chisel Bits have 7-inch twist, 10-inch overall length for use in 5-inch blade hollow chisels No. 103-B or No. 103-H. Shank specifications are given below.

This type, which has knife edged cutting spurs without point, should be used where it is necessary to make partial cuts and is recommended for use in the softer woods.

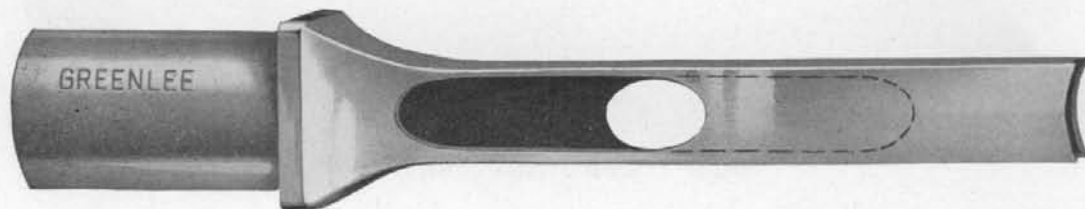
On page 17 we show our No. 122-H Bits which are designed principally for use in the harder woods and where partial cuts are not made. Either type may be used interchangeably with the Regular or Hard-Wear chisels.

Specify pattern desired and note MAKE and STYLE NUMBER of machine.

Listed sizes carried in stock.

LIST PRICE EACH

Size	Price	Shank	Code
$\frac{3}{8}$ "	\$1.35	$\frac{19}{64}$ "x3"	SAFENESS
$\frac{7}{16}$ "	1.35	$\frac{19}{64}$ "x3"	SAFETYCAR
$\frac{1}{2}$ "	1.35	$\frac{19}{64}$ "x3"	SAFETYINK
$\frac{9}{16}$ "	1.45	$\frac{19}{64}$ "x3"	SAFETYNUIT
$\frac{5}{8}$ "	1.60	$\frac{19}{64}$ " or $\frac{1}{2}$ "x3"	SAFFIAN
$\frac{3}{4}$ "	1.90	$\frac{19}{64}$ " or $\frac{1}{2}$ "x3"	SAFFRAN
$\frac{7}{8}$ "	2.30	$\frac{1}{2}$ "x3"	SAGENITE
1"	2.60	$\frac{1}{2}$ "x3"	SAGITAL
$1\frac{1}{8}$ "	2.85	$\frac{1}{2}$ "x3"	SAGITO
$1\frac{1}{4}$ "	3.10	$\frac{1}{2}$ "x3"	SAGIWA



No. 103-H Hard-Wear Hollow Chisel

5-INCH BLADE

Patented Dec. 27, 1921

OUR No. 103-H Hollow Chisels having 5-inch blade are carried in stock to take care of requirements where a 4-inch blade does not give the desired depth of mortising. Chisels carried in stock of this length have minimum shank diameter of $1\frac{1}{8}$ inches and cannot be used in machines having chisel sockets of smaller diameter.

This type has two openings, one near shoulder, the other close to cutting edge on opposite side. This allows quicker chip relief, reduces heating, prevents clogging and eases the strain on the twist of the bit.

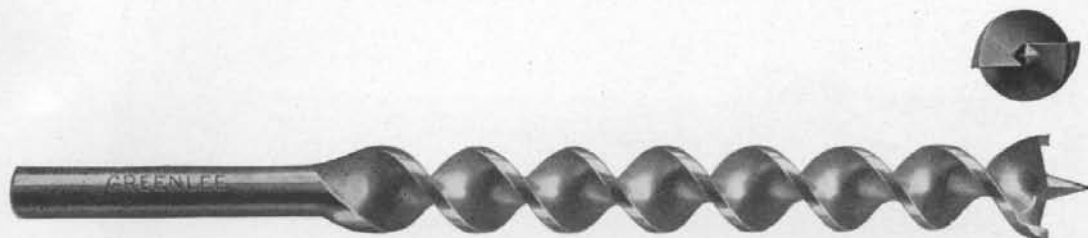
These chisels require either our No. 122-B or No. 122-H Hollow Chisel Bits illustrated on pages 15 and 17 respectively.

In ordering specify MAKE and STYLE NUMBER of machine in which they are to be used.

Listed sizes carried in stock.

LIST PRICE EACH

Size	Price	Shank	Mortise	Code
$\frac{3}{8}$ "	\$5.80	$1\frac{1}{8}$ " x $1\frac{3}{4}$ "	$3\frac{3}{4}$ " deep	SAMARITE
$\frac{7}{16}$ "	6.20	$1\frac{1}{8}$ " x $1\frac{3}{4}$ "	$3\frac{3}{4}$ " deep	SAMARIUM
$\frac{1}{2}$ "	6.60	$1\frac{1}{8}$ " x $1\frac{3}{4}$ "	$3\frac{3}{4}$ " deep	SAMARKAND
$\frac{9}{16}$ "	7.05	$1\frac{1}{8}$ " x $1\frac{3}{4}$ "	$3\frac{3}{4}$ " deep	SARMARSKITE
$\frac{5}{8}$ "	7.45	$1\frac{1}{8}$ " x $1\frac{3}{4}$ "	$3\frac{3}{4}$ " deep	SAMAROPSIS
$\frac{3}{4}$ "	8.25	$1\frac{1}{8}$ " x $1\frac{3}{4}$ "	$3\frac{3}{4}$ " deep	SAMASAMA
$\frac{7}{8}$ "	9.10	$1\frac{3}{8}$ " x $1\frac{3}{4}$ "	$3\frac{3}{4}$ " deep	SAMATUS
1"	9.90	$1\frac{3}{8}$ " x $1\frac{3}{4}$ "	$3\frac{3}{4}$ " deep	SAMAVEDA



No. 122-H Hard-Wear Hollow Chisel Bit

7-INCH TWIST—10-INCH OVERALL

Patented Dec. 27, 1921

THE No. 122-H Hard-Wear Hollow Chisel Bits have 7-inch twist, 10-inch overall length and are suitable for use in all five-inch blade hollow chisels. Complete shank specifications are given below.

These differ from the regular No. 122-B on page 15 in that they have brad point to center the bit and broad faced cutting spurs that will remove the stock instead of forcing to one side after severing the fibres. These cutting spurs will stand up for considerably longer wear in the harder woods.

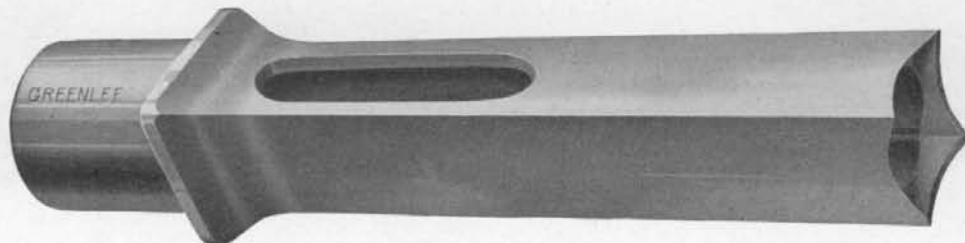
When mortising in the hard wood the broad faced spurs hold down excessive heating and such heating as does occur will be readily absorbed on account of heavier body of metal at this point. For further comparison see page 5.

In ordering, information as to MAKE and STYLE NUMBER of machine should be carefully noted.

Listed sizes carried in stock.

LIST PRICE EACH

Size	Price	Shank	Code
$\frac{3}{8}$ "	\$1.35	$\frac{19}{64}$ "x3"	SAMBAL
$\frac{7}{16}$ "	1.35	$\frac{19}{64}$ "x3"	SAMBAQUI
$\frac{1}{2}$ "	1.35	$\frac{19}{64}$ "x3"	SAMBONG
$\frac{9}{16}$ "	1.45	$\frac{19}{64}$ "x3"	SAMBOOK
$\frac{5}{8}$ "	1.60	$\frac{1}{2}$ "x3"	SAMBOR
$\frac{3}{4}$ "	1.90	$\frac{1}{2}$ "x3"	SAMBOURNE
$\frac{7}{8}$ "	2.30	$\frac{1}{2}$ "x3"	SAMBRE
1"	2.60	$\frac{1}{2}$ "x3"	SAMBUCA



No. 104-B Regular Hollow Chisel

6 $\frac{1}{2}$ -INCH BLADE

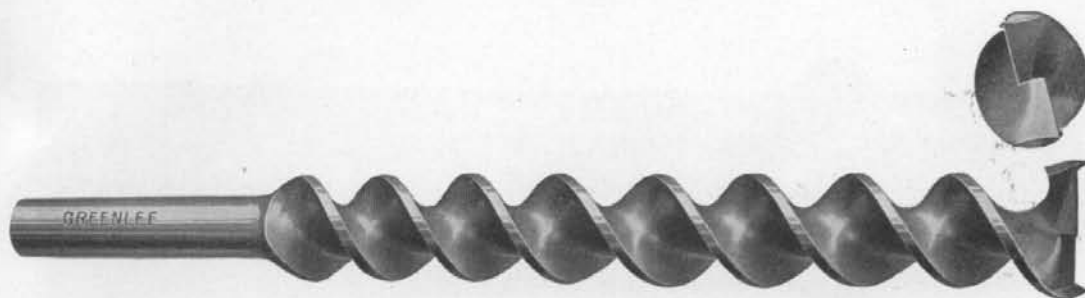
CHISELS of this length are for use in medium mortisers, requiring bits with 9-inch twist, 12-inch overall length, No. 123-B or in the large car mortisers, requiring bits 10-inch twist, 14-inch overall length, our No. 124-B.

Sizes $\frac{9}{16}$ -inch and smaller have reinforced blade and sizes $\frac{5}{8}$ -inch and larger are regularly made with straight blade. Specify MAKE and STYLE NUMBER of machine and give bit dimensions.

Listed sizes carried in stock.

LIST PRICE EACH

Size	Price	Shank	Mortise	Code
$\frac{3}{8}$ "	\$7.20	1 $\frac{1}{8}$ "x2"	3 $\frac{1}{4}$ " deep	SAIGINAE
$\frac{7}{16}$ "	7.60	1 $\frac{1}{8}$ "x2"	3 $\frac{1}{2}$ " deep	SAIKLESS
$\frac{1}{2}$ "	8.00	1 $\frac{1}{8}$ "x2"	3 $\frac{1}{2}$ " deep	SAILABLE
$\frac{9}{16}$ "	8.40	1 $\frac{1}{8}$ "x2"	3 $\frac{1}{2}$ " deep	SAILBOAT
$\frac{5}{8}$ "	8.80	1 $\frac{1}{8}$ "x2"	5 $\frac{1}{8}$ " deep	SAILCLOTH
$\frac{11}{16}$ "	9.20	1 $\frac{1}{8}$ "x2"	5 $\frac{1}{8}$ " deep	SAILERS
$\frac{3}{4}$ "	9.60	1 $\frac{1}{8}$ "x2"	5 $\frac{1}{8}$ " deep	SAILFISH
$\frac{7}{8}$ "	10.45	1 $\frac{3}{8}$ "x2"	5 $\frac{1}{8}$ " deep	SAILHOOK
1"	11.30	1 $\frac{3}{8}$ "x2"	5 $\frac{1}{2}$ " deep	SAILLANT
1 $\frac{1}{8}$ "	12.40	1 $\frac{3}{8}$ "x2"	5 $\frac{1}{2}$ " deep	SAILLOFT
1 $\frac{1}{4}$ "	13.40	1 $\frac{3}{4}$ "x2"	5" deep	SAILMAKE
1 $\frac{3}{8}$ "	14.60	1 $\frac{3}{4}$ "x2"	5 $\frac{1}{4}$ " deep	SAILROOM
1 $\frac{1}{2}$ "	15.80	1 $\frac{3}{4}$ "x2"	5 $\frac{1}{4}$ " deep	SAIMIRI
1 $\frac{5}{8}$ "	17.30	2 $\frac{1}{4}$ "x2"	5" deep	SAINFOIN
1 $\frac{3}{4}$ "	18.70	2 $\frac{1}{4}$ "x2"	5" deep	SAINTDOM
1 $\frac{7}{8}$ "	20.40	2 $\frac{1}{4}$ "x2"	5" deep	SAINTED
2"	22.00	2 $\frac{1}{4}$ "x2"	5" deep	SAINESS
2 $\frac{1}{8}$ "	24.10	2 $\frac{3}{4}$ "x2"	5" deep	SAINTISH
2 $\frac{1}{4}$ "	26.20	2 $\frac{3}{4}$ "x2"	5 $\frac{1}{2}$ " deep	SAIRING
2 $\frac{1}{2}$ "	31.10	2 $\frac{3}{4}$ "x2"	5 $\frac{1}{2}$ " deep	SAIVISM



No. 123-B and No. 124-B Regular Hollow Chisel Bits

No. 123-B, 9" TWIST 12" OVERALL

No. 124-B, 10" TWIST 14" OVERALL

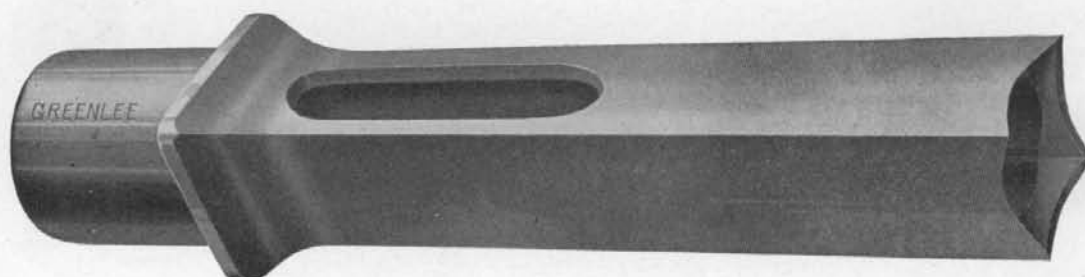
OUR No. 123-B Hollow Chisel Bits are required for use in 6½-inch blade Hollow Chisels our No. 104-B in the medium mortisers. The No. 124-B Hollow Chisel Bits are used with 6½-inch blade Hollow Chisels in the large car mortisers and with 8-inch blade chisels in the medium machines.

In ordering specify MAKE and STYLE NUMBER of machine.

Listed sizes carried in stock.

LIST PRICE EACH

No. 123-B			No. 124-B		
Size	Price	Code	Shank	Price	Code
3/8"	\$1.50	SALAMEE	19/64"	\$1.75	SALINAS
7/16"	1.50	SALABLE	19/64"	1.75	SALINOUS
1/2"	1.50	SALACITY	19/64"	1.75	SALINITY
9/16"	1.60	SALADING	19/64"	1.90	SALIQUE
5/8"	1.75	SALAGANE	1/2"	2.00	SALISHAN
11/16"	1.85	SALAMBA	1/2"	2.20	SALITER
3/4"	2.00	SALANGID	5/8"	2.40	SALITRAL
7/8"	2.40	SALIDAE	5/8"	2.80	SALIVOUS
1"	2.75	SALENIA	5/8"	3.25	SALLOWY
1 1/8"	3.00	SALESIAN	5/8"	3.50	SALMIAC
1 1/4"	3.30	SALESMAN	5/8"	3.70	SALMOID
1 3/8"	3.65	SALEWORK	5/8"	3.90	SALMONET
1 1/2"	3.90	SALGRAM	5/8"	4.25	SALOPIAN
1 5/8"	.....	.....	5/8"	4.50	SALPACEA
1 3/4"	4.70	SALICIN	5/8"	4.80	SALPICON
1 7/8"	.....	.....	5/8"	5.25	SALPIDAE
2"	5.30	SALIENT	5/8"	5.70	SALPINX
2 1/8"	.....	.....	5/8"	6.20	SALPOID
2 1/4"	.....	.....	5/8"	7.25	SALSIFY
2 1/2"	.....	.....	5/8"	8.50	SALSODA



No. 105-B Regular Hollow Chisel

8-INCH BLADE—10-INCH OVERALL

HOLLOW Chisels with 8-inch blade No. 105-B require bits with 11-inch twist, 15 inches overall, our No. 125-B, when used in the large car mortisers. When used in the medium machines, bits with 10-inch twist, 14-inch overall length, our No. 124-B, are suitable.

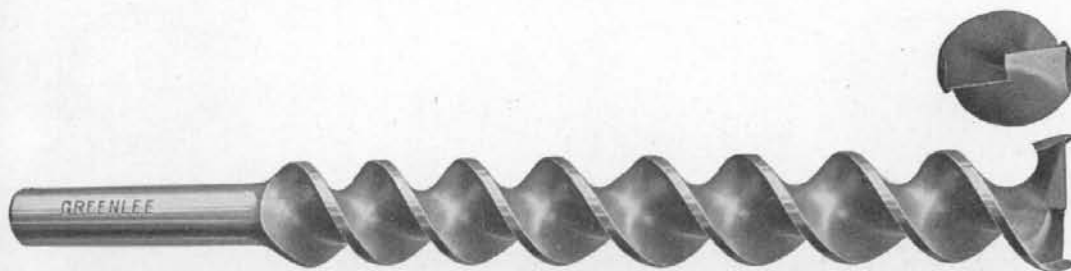
This is the longest length of blade carried in stock although if greater length is desired, we make special to order, figuring from list shown below, advanced 10% for each inch or fraction thereof over the 8-inch length. See page 31 covering special hollow chisels.

Specify MAKE and STYLE NUMBER of machine in which same will be used.

Listed sizes carried in stock.

LIST PRICE EACH

Size	Price	Shank	Mortise	Code
$\frac{3}{4}$ "	\$10.35	$1\frac{1}{8}$ "x2"	$6\frac{3}{4}$ " deep	SALTABLE
$\frac{7}{8}$ "	11.30	$1\frac{3}{8}$ "x2"	$6\frac{3}{4}$ " deep	SALTANT
1"	12.25	$1\frac{3}{8}$ "x2"	$6\frac{3}{4}$ " deep	SALTBUSH
$1\frac{1}{8}$ "	13.50	$1\frac{3}{8}$ "x2"	$6\frac{3}{4}$ " deep	SALTCAKE
$1\frac{1}{4}$ "	14.60	$1\frac{3}{4}$ "x2"	$6\frac{3}{4}$ " deep	SALTCAT
$1\frac{3}{8}$ "	16.00	$1\frac{3}{4}$ "x2"	$6\frac{3}{4}$ " deep	SALTCOTE
$1\frac{1}{2}$ "	17.40	$1\frac{3}{4}$ "x2"	$6\frac{3}{4}$ " deep	SALTDUTY
$1\frac{5}{8}$ "	19.00	$2\frac{1}{4}$ "x2"	$6\frac{3}{4}$ " deep	SALTERN
$1\frac{3}{4}$ "	20.50	$2\frac{1}{4}$ "x2"	$6\frac{3}{4}$ " deep	SALTFOOT
$1\frac{7}{8}$ "	22.30	$2\frac{1}{4}$ "x2"	$6\frac{3}{4}$ " deep	SALTING
2"	24.00	$2\frac{1}{4}$ "x2"	$6\frac{3}{4}$ " deep	SALTIRE
$2\frac{1}{8}$ "	26.30	$2\frac{3}{4}$ "x2"	$6\frac{3}{4}$ " deep	SALTISH
$2\frac{1}{4}$ "	28.50	$2\frac{3}{4}$ "x2"	$6\frac{3}{4}$ " deep	SALTNESSE
$2\frac{1}{2}$ "	33.75	$2\frac{3}{4}$ "x2"	$6\frac{3}{4}$ " deep	SALTCLICK



No. 125-B Regular Hollow Chisel Bit

11-INCH TWIST—15 INCH OVERALL

OUR No. 125-B Hollow Chisel Bits have 11-inch twist, 15-inch overall length and are required with 8-inch blade hollow chisels, our No. 105-B, when used in the large car mortising machines. When using 8-inch blade chisels in medium mortisers they require No. 124-B Hollow Chisel Bits shown on page 19.

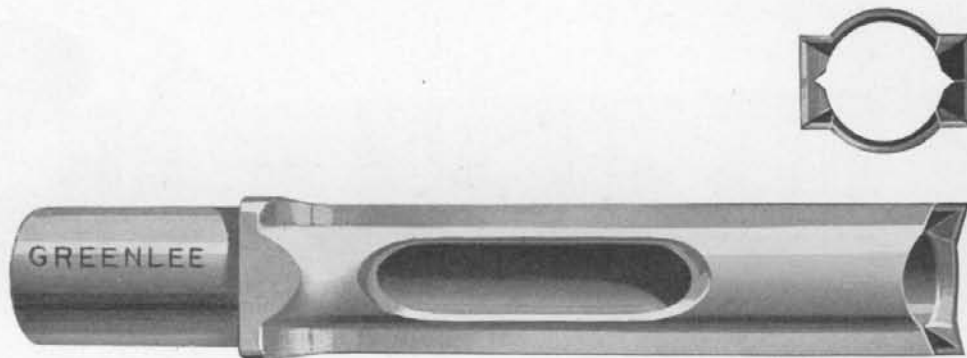
When hollow chisels of extra length of blade are used, bits of correspondingly lengthened twist are necessary. Use price list as shown page 30 increased according to quantity ordered as outlined on page 31.

MAKE and STYLE NUMBER of machine should be noted in ordering.

Listed sizes carried in stock.

LIST PRICE EACH

Size	Price	Shank	Code
$\frac{3}{4}$ "	\$2.50	$\frac{5}{8}$ " x 4"	SALTMINE
$\frac{7}{8}$ "	2.90	$\frac{5}{8}$ " x 4"	SALTPAN
1"	3.50	$\frac{5}{8}$ " x 4"	SALTTREE
$1\frac{1}{8}$ "	3.75	$\frac{5}{8}$ " x 4"	SALTWELL
$1\frac{1}{4}$ "	4.00	$\frac{5}{8}$ " x 4"	SALTWORT
$1\frac{3}{8}$ "	4.25	$\frac{5}{8}$ " x 4"	SALUTARY
$1\frac{1}{2}$ "	4.65	$\frac{5}{8}$ " x 4"	SALUTER
$1\frac{5}{8}$ "	5.00	$\frac{5}{8}$ " x 4"	SALVABLE
$1\frac{3}{4}$ "	5.50	$\frac{5}{8}$ " x 4"	SALVAGE
$1\frac{7}{8}$ "	6.00	$\frac{5}{8}$ " x 4"	SALVEBUG
2"	6.75	$\frac{5}{8}$ " x 4"	SALVELINE
$2\frac{1}{8}$ "	7.50	$\frac{5}{8}$ " x 4"	SALVIFIC
$2\frac{1}{4}$ "	9.00	$\frac{5}{8}$ " x 4"	SALVING
$2\frac{1}{2}$ "	10.00	$\frac{5}{8}$ " x 4"	SALVORS



No. 100-B Oblong Bar Chisel

4-INCH BLADE

TO meet the demand for a Hollow Chisel to make extreme oblong mortises, which are common in sash and door manufacture, we designed and originated the Greenlee No. 100 Oblong Bar Chisel illustrated above. We carry in stock only the $\frac{3}{8}$ "x $\frac{3}{4}$ " size as listed below.

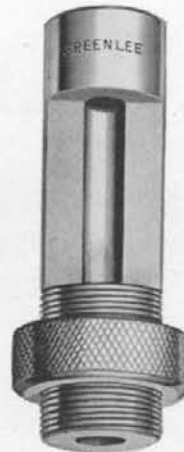
Extreme sizes of Oblong Hollow Chisels made with rectangular sides are impractical due to the small bore not permitting proper clearance of chips. This new type has increased section on the wide side, measuring $\frac{5}{8}$ inches on the $\frac{3}{8}$ "x $\frac{3}{4}$ " size, allowing a $\frac{1}{2}$ -inch bore which gives ample room for chip clearance. Stock Hollow Chisels of this type require Hollow Chisel Bits with $\frac{5}{8}$ -inch diameter head.

A Hollow Chisel of this shape is considerably stronger due to the heavy walls on all sides. The fact that a large diameter bit is used in connection with a tool of this type, reduces the mortising strain and insures long wear. This style of Hollow Chisel is economical in that it will give better service and reduce, to a large extent, layout work.

Special sizes of extreme Oblong Hollow Chisels can also be made for successful operation, prices quoted upon application.

LIST PRICE EACH

Size	Price	Shank	Mortise	Code
$\frac{3}{8}$ "x $\frac{3}{4}$ "	\$8.00	$\frac{3}{4}$ "x1 $\frac{1}{2}$ "	3" deep	SACCULE

No. 115 SPLIT
BIT BUSHINGNo. 116 SPLIT
CHISEL BUSHINGNo. 117 ADJUSTABLE
BIT BUSHING

Hollow Chisel and Bit Bushings

Split Bit Bushings, our No. 115, are carried of the following specifications:

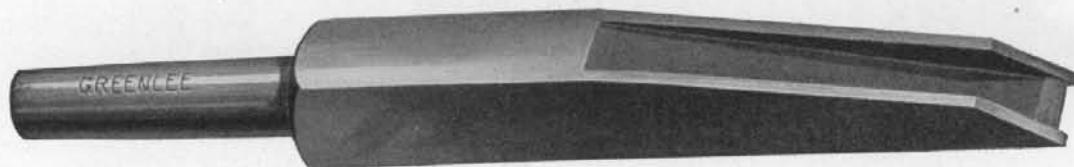
$\frac{19}{64}$ " outside diameter.....	$\frac{3}{16}$ " and $\frac{1}{4}$ " hole
$\frac{1}{2}$ " outside diameter.....	$\frac{3}{16}$ ", $\frac{1}{4}$ " and $\frac{19}{64}$ " hole
$\frac{5}{8}$ " outside diameter.....	$\frac{3}{16}$ ", $\frac{1}{4}$ ", $\frac{19}{64}$ " and $\frac{1}{2}$ " hole
$\frac{3}{4}$ " outside diameter.....	$\frac{1}{2}$ " and $\frac{5}{8}$ " hole

No. 116 Split Chisel Bushings are carried in stock of following specifications:

$\frac{7}{8}$ " outside diameter.....	$\frac{5}{8}$ " and $\frac{3}{4}$ " hole
$1\frac{1}{8}$ " outside diameter.....	$\frac{5}{8}$ " and $\frac{3}{4}$ " hole
$1\frac{3}{8}$ " outside diameter.....	$\frac{5}{8}$ ", $\frac{3}{4}$ " and $1\frac{1}{8}$ " hole
$1\frac{3}{4}$ " outside diameter.....	$\frac{5}{8}$ ", $\frac{3}{4}$ ", $1\frac{1}{8}$ " and $1\frac{3}{8}$ " hole
2" outside diameter.....	$\frac{5}{8}$ ", $\frac{3}{4}$ ", $1\frac{1}{8}$ ", $1\frac{3}{8}$ " and $1\frac{3}{4}$ " hole
$2\frac{1}{4}$ " outside diameter.....	$\frac{5}{8}$ ", $\frac{3}{4}$ ", $1\frac{1}{8}$ ", $1\frac{3}{8}$ " and $1\frac{3}{4}$ " hole
$2\frac{3}{4}$ " outside diameter.....	$1\frac{1}{8}$ ", $1\frac{3}{8}$ ", $1\frac{3}{4}$ " and $2\frac{1}{4}$ " hole

The No. 117 Adjustable Bit Bushing is carried only with $\frac{3}{4}$ -inch outside diameter, $\frac{3}{16}$, $\frac{1}{4}$, $\frac{19}{64}$, $\frac{1}{2}$ and $\frac{5}{8}$ -inch hole.

Bushings of special dimensions can be made to order. Prices on stock and special bushings quoted on application.



No. 131 Ordinary Mortising Chisel

THE No. 131 Ordinary Mortising Chisel has $4\frac{3}{4}$ -inch blade and taper shank suitable for a number of different machines. The taper shank measures $\frac{3}{64}$ to $\frac{29}{64} \times 1\frac{3}{4}$ -inch long.

The No. 132 Mortising Chisels are made with the lipped pattern of blade and with taper shank, measuring $\frac{3}{64}$ to $\frac{27}{64} \times 1\frac{3}{4}$ -inch long.

The shank must properly fit into the taper socket of the machine if correct results are to be obtained. There are so many different machines with so many varying tapers that measurements should be taken with micrometer, noting the diameter at each end and length of the shank.

On first order it is advisable to send an old chisel having correct taper shank which we may use as a guide in making the new tools. Measurements of a taper shank taken with a ruler are too inaccurate and will not give proper fit necessary for good results.

Stock carried only in No. 131 and 132 types in sizes $\frac{3}{16}$ to 1-inch and with taper shanks as shown. See page 31 for specials.

NO. 131 AND 132 SASH MORTISING CHISELS

LIST PRICE EACH

Sizes	$\frac{3}{16}$ " to $\frac{7}{8}$ "	1 to $1\frac{1}{8}$ "	$1\frac{1}{4}$ to $1\frac{1}{2}$ "
Price	\$2.00	\$2.50	\$3.00



Nos. 141 and 142 Routing Bits

No. 142, RIGHT HAND

No. 141, LEFT HAND

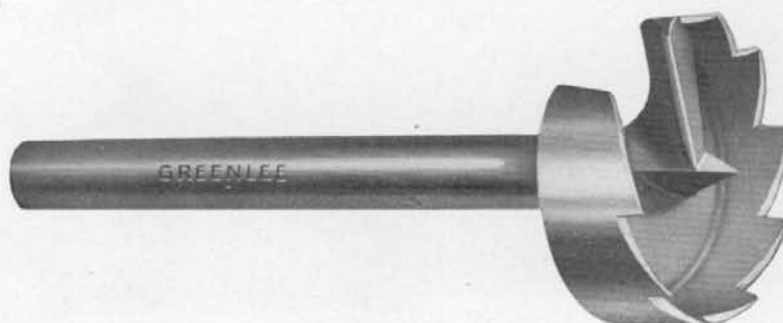
ROUTING Bits are carried in stock with square cutting end and with $\frac{1}{2}$ -inch round shank. Straight shank Routing Bits as well as other types of cutting ends can be made promptly to order.

Hand Hole Routers are specials made with two flutes as shown or with three flutes. We can make these with straight blade or with attachment for rounding the corners of hand holes, this attachment to be either fixed or adjustable.

Stock is carried only of No. 142 Right Hand Routing Bits in sizes as listed. Special routing bits with 2-inch flute or less take list as given below, for longer lengths of flute add 20% increment for each extra inch or fraction thereof and see page 31 for quantity extras.

LIST PRICE EACH

Size	Price	Length Flute	Shank	Code
$\frac{3}{16}$ "	\$1.80	$1\frac{1}{2}$ "	$\frac{1}{2}$ " x $1\frac{3}{4}$ "	SANDBABY
$\frac{1}{4}$ "	1.80	$1\frac{1}{2}$ "	$\frac{1}{2}$ " x $1\frac{3}{4}$ "	SANDBAG
$\frac{5}{16}$ "	1.80	$1\frac{1}{2}$ "	$\frac{1}{2}$ " x $1\frac{3}{4}$ "	SANDBALL
$\frac{3}{8}$ "	1.80	$1\frac{3}{4}$ "	$\frac{1}{2}$ " x $1\frac{3}{4}$ "	SANDBANK
$\frac{7}{16}$ "	1.80	$1\frac{3}{4}$ "	$\frac{1}{2}$ " x $1\frac{3}{4}$ "	SANDBATH
$\frac{1}{2}$ "	1.80	$1\frac{3}{4}$ "	$\frac{1}{2}$ " x $1\frac{3}{4}$ "	SANDBEAR
$\frac{5}{8}$ "	2.40	$1\frac{3}{4}$ "	$\frac{1}{2}$ " x $1\frac{3}{4}$ "	SANDBUG
$\frac{3}{4}$ "	2.90	$1\frac{3}{4}$ "	$\frac{1}{2}$ " x $1\frac{3}{4}$ "	SANDCLAM
$\frac{7}{8}$ "	3.40	$1\frac{3}{4}$ "	$\frac{1}{2}$ " x $1\frac{3}{4}$ "	SANDCORN
1"	3.90	$1\frac{3}{4}$ "	$\frac{1}{2}$ " x $1\frac{3}{4}$ "	SANDCRAB



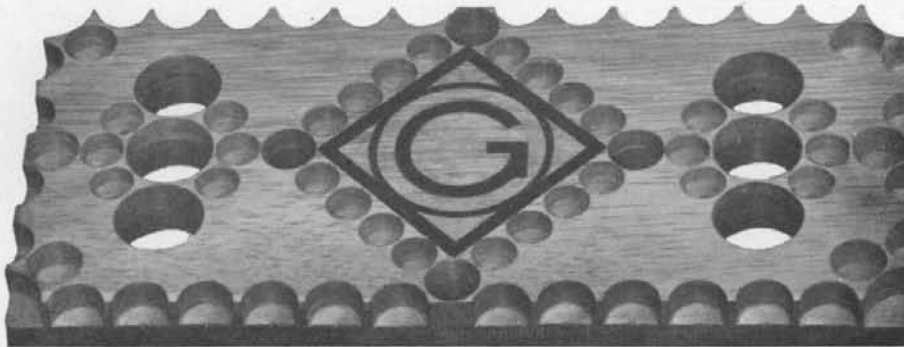
No. 149 Multi-Spur Machine Bit

Patent Applied for

THE new Greenlee Multi-Spur Machine Bit was designed to meet the need for a fast, smooth boring bit. Stock is carried in sizes from $\frac{3}{8}$ to 2 inches in diameter as listed below, $\frac{1}{2}$ -inch diameter shank, overall lengths ranging from $5\frac{1}{2}$ inches to $5\frac{3}{4}$ inches. Sizes $2\frac{1}{16}$ to 3 inches are made to order within a reasonable length of time, and can be made with any practical diameter of shank.

LIST PRICE EACH

Size	Price	Code	Size	Price	Code
$\frac{3}{8}$ "	\$1.20	SERAC	$1\frac{3}{8}$ "	\$2.55	SERGEANT
$\frac{7}{16}$ "	1.20	SERAGLIO	$1\frac{7}{16}$ "	2.85	SERIALITY
$\frac{1}{2}$ "	1.25	SERAI	$1\frac{1}{2}$ "	3.20	SERAITE
$\frac{9}{16}$ "	1.35	SERAPE	$1\frac{5}{8}$ "	3.30	SERIATIM
$\frac{5}{8}$ "	1.35	SERAPEUM	$1\frac{3}{4}$ "	3.55	SERICEOUS
$1\frac{1}{16}$ "	1.40	SERAPH	$1\frac{7}{8}$ "	3.80	SERICIN
$\frac{3}{4}$ "	1.50	SERAPHINEL	2"	4.05	SERICITE
$1\frac{3}{16}$ "	1.60	SERASKIERL	$2\frac{1}{8}$ "	10.00	SERIEMA
$\frac{7}{8}$ "	1.60	SERBIAN	$2\frac{1}{4}$ "	12.00	SERIGRAPH
$1\frac{5}{16}$ "	1.90	SERDAB	$2\frac{3}{8}$ "	14.00	SERINGA
1"	1.90	SEREIN	$2\frac{1}{2}$ "	16.00	SERIOUS
$1\frac{1}{16}$ "	2.00	SERENADE	$2\frac{5}{8}$ "	18.00	SERJANIA
$1\frac{1}{8}$ "	2.00	SERENE	$2\frac{3}{4}$ "	20.00	SERMONET
$1\frac{3}{8}$ "	2.15	SERENITY	$2\frac{7}{8}$ "	22.00	SERMONIZE
$1\frac{1}{4}$ "	2.40	SERENOA	3"	24.00	SEROSA
$1\frac{5}{8}$ "	2.40	SERFAGE			

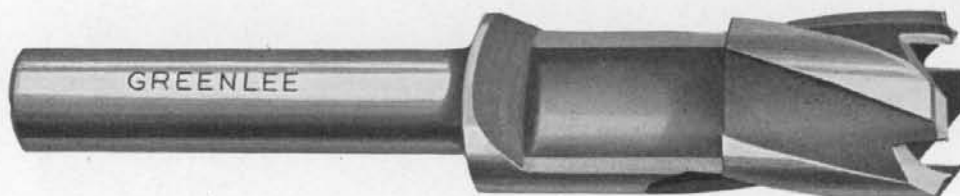


Sample of Boring with Multi-Spur Bit

THE above illustration gives an idea of the boring ability of the Greenlee Multi-Spur Machine Bit. It is especially adapted to cutting with ease and accuracy, any arc of a circle on an edge of a piece of stock. Smooth, clean cut holes can be bored equally well in various woods and in cross or end grain. Holes can be bored at an angle, overlapping or at close centers, without danger of splitting. Due to its light, sturdy construction, larger holes can be bored with a smaller spindle machine and with minimum power consumption.

The rim of the tool has a series of spurs or teeth similar to those of a saw, which outline the hole. A strong single cutter, with opening enlarged at the back to provide quick chip removal, cuts out the portion outlined by the spurs, and the brad point tends to steady it while boring. It operates with a minimum of friction, will not choke with chips, and is easily sharpened when necessary.

Beyond question, this new variable-speed bit represents the greatest improvement made in boring tools for many years. Due to its boring qualities and long life, it is ideal for furniture factories, auto body, implement and car shops.



No. 140 Plug Cutting Bit

GREENLEE No. 140 Plug Cutting Bit is carried in stock with 2¼-inch fluted section, ½x2¼-inch shank, 4½-inch overall length. Size of bit denotes diameter of plug tool will cut.

This is a free, easy cutting tool, suitable for use in all kinds of wood, and can be operated in any boring machine equipped to handle a ½-inch shank.

LIST PRICE EACH

Size	Price	Code
3/8"	\$5.00	SUADE
7/16"	5.00	SUAGE
1/2"	5.00	SUANT
9/16"	5.50	SUARROW
5/8"	5.50	SUASIBLE
11/16"	6.00	SUASION
3/4"	6.00	SUASORY
13/16"	6.50	SUASTIKA
7/8"	7.00	SUAVIFY
15/16"	7.50	SUAVITY
1"	8.00	SUBACID
1 1/8"	8.50	SUBAEL
1 1/4"	9.00	SUBAI
1 3/8"	10.00	SUBALTERN
1 1/2"	12.00	SUBANO
1 5/8"	14.00	SUBAUD
1 7/8"	16.00	SUBARID
2"	18.00	SUBARCH



Stock of Machine Bits

CHECK this assortment of Machine Bits which we regularly carry in stock to insure prompt delivery and to avoid the necessity of making specials as such cost on higher basis. The No. 150 Double Spur pattern is the most extensively used and for this reason we carry our most complete stock in this type.

STOCK OF NO. 150 DOUBLE SPUR MACHINE BITS

4-inch twist, $\frac{1}{2}$ "x $2\frac{1}{4}$ " shank, sizes by 16ths from $\frac{3}{16}$ to 1-inch.
5-inch twist, $\frac{1}{2}$ "x $2\frac{1}{4}$ " shank, sizes by 16ths from $\frac{3}{16}$ to 1-inch.
6-inch twist, $\frac{1}{2}$ "x $2\frac{1}{4}$ " shank, sizes by 16ths from $\frac{3}{16}$ to 2-inch.
8-inch twist, $\frac{1}{2}$ "x $2\frac{1}{4}$ " shank, sizes by 16ths from $\frac{1}{4}$ to $1\frac{1}{8}$ -inch.
10-inch twist, $\frac{1}{2}$ "x $2\frac{1}{4}$ " shank, sizes by 16ths from $\frac{5}{16}$ to $1\frac{1}{8}$ -inch.
12-inch twist, $\frac{1}{2}$ "x $2\frac{1}{4}$ " shank, sizes by 16ths from $\frac{3}{8}$ to 2-inch.
14-inch twist, $\frac{1}{2}$ "x $2\frac{1}{4}$ " shank, sizes $\frac{9}{16}$, $\frac{11}{16}$, $\frac{13}{16}$, $\frac{15}{16}$ and $1\frac{1}{16}$ -inch.

8-inch twist, $\frac{3}{4}$ "x $2\frac{1}{4}$ " shank, sizes by 16ths from $\frac{5}{16}$ to 1-inch.
10-inch twist, $\frac{3}{4}$ "x $2\frac{1}{4}$ " shank, sizes by 16ths from $\frac{3}{8}$ to $1\frac{1}{8}$ -inch.
12-inch twist, $\frac{3}{4}$ "x $2\frac{1}{4}$ " shank, sizes by 16ths from $\frac{3}{8}$ to 2-inch.
14-inch twist, $\frac{3}{4}$ "x $2\frac{1}{4}$ " shank, sizes by 16ths from $\frac{3}{8}$ to 2-inch.
16-inch twist, $\frac{3}{4}$ "x $2\frac{1}{4}$ " shank, sizes $\frac{9}{16}$, $\frac{11}{16}$, $\frac{13}{16}$, $\frac{15}{16}$ and $1\frac{1}{16}$ -inch.

STOCK OF NO. 151 EXTENSION LIP MACHINE BITS

4-inch twist, $\frac{1}{2}$ "x $2\frac{1}{4}$ " shank, sizes by 16ths from $\frac{1}{4}$ to 1-inch.
6-inch twist, $\frac{1}{2}$ "x $2\frac{1}{4}$ " shank, sizes by 16ths from $\frac{1}{4}$ to $1\frac{1}{4}$ -inch.

STOCK OF NO. 152 ACME MACHINE BITS

6-inch twist, $\frac{1}{2}$ "x $2\frac{1}{4}$ " shank, sizes by 16ths from $\frac{1}{4}$ to 1-inch.

STOCK OF NO. 155 SOLID CENTER MACHINE BITS

6-inch twist, $\frac{1}{2}$ "x $2\frac{1}{4}$ " shank, sizes by 16ths from $\frac{1}{4}$ to $1\frac{1}{4}$ -inch.

All Machine Bits in the above list are carried in finished stock and immediate delivery can be made. Machine Bits of other specifications must be made to order. See page 31 on specials.



Standard Machine Bit List

LIST PRICE PER DOZEN

SIZES IN SIXTEENTHS

Size 16th	6-inch Twist or less	8-inch Twist	10-inch Twist	12-inch Twist	14-inch Twist	Each Extra 2-inch Twist
4	\$10.80	\$12.96	\$15.12	\$17.28		
5	10.80	12.96	15.12	17.28		
6	10.80	12.96	15.12	17.28	\$19.44	\$2.16
7	10.80	12.96	15.12	17.28	19.44	2.16
8	10.80	12.96	15.12	17.28	19.44	2.16
9	12.00	14.40	16.80	19.20	21.60	2.40
10	13.20	15.84	18.48	21.12	23.76	2.64
11	14.40	17.28	20.16	23.04	25.92	2.88
12	15.60	18.72	21.84	24.96	28.08	3.12
13	16.80	20.16	23.52	26.88	30.24	3.36
14	18.00	21.60	25.20	28.80	32.40	3.60
15	19.20	23.04	26.88	30.72	34.56	3.84
16	20.40	24.48	28.56	32.64	36.72	4.08
17	21.60	25.92	30.24	34.56	38.88	4.32
18	22.80	27.36	31.92	36.48	41.04	4.56
19	24.00	28.80	33.60	38.40	43.20	4.80
20	25.20	30.24	35.28	40.32	45.36	5.04
21	26.40	31.68	36.96	42.24	47.52	5.28
22	27.60	33.12	38.64	44.16	49.68	5.52
23	28.80	34.56	40.32	46.08	51.84	5.76
24	30.00	36.00	42.00	48.00	54.00	6.00
25	31.50	37.80	44.10	50.40	56.70	6.30
26	33.00	39.60	46.20	52.80	59.40	6.60
27	34.50	41.40	48.30	55.20	62.10	6.90
28	36.00	43.20	50.40	57.60	64.80	7.20
29	37.50	45.00	52.50	60.00	67.50	7.50
30	39.00	46.80	54.60	62.40	70.20	7.80
31	40.50	48.60	56.70	64.80	72.90	8.10
32	42.00	50.40	58.80	67.20	75.60	8.40
33	43.80	52.56	61.32	70.08	78.84	8.76
34	45.60	54.72	63.84	72.96	82.08	9.12
35	47.40	56.88	66.36	75.84	85.32	9.48
36	49.20	59.04	68.88	78.72	88.56	9.84
37	51.00	61.20	71.40	81.60	91.80	10.20
38	52.80	63.36	73.92	84.48	95.04	10.56
39	54.60	65.52	76.44	87.36	98.28	10.92
40	56.40	67.68	78.96	90.24	101.52	11.28
42	60.60	72.72	84.84	96.96	109.08	12.12
44	64.80	77.76	90.72	103.68	116.64	12.96
46	69.00	82.80	96.60	110.40	124.20	13.80
48	73.20	87.84	102.48	117.12	131.76	14.64



Prices on Special Tools

SPECIAL Machine Bits not included in the list of stock bits shown on page 29 must be made special and figure on higher cost basis, as stock tools are made up in large quantities, thereby reducing manufacturing costs.

On special Machine Bits which must be made up to order the machine bit list shown on page 30 is used but advanced on the following quantity extra basis:

1 of one size and type	double list
2 do	list plus two-thirds
3 do	list plus one-half
4 or 5 do	list plus one-third
6 to 11 do	list plus 20%
12 to 23 do	list plus 10%
24 or more of any size or type	regular list

Hollow Chisels and Split Shank Countersinks, which must be made special to order, figure at only one-half the extras as on Machine Bits. For example, one only takes list advanced 50%, two at list plus one-third, etc. Twelve or more figure at list without extras added.

All special Hollow Chisel Bits, Drills, Routing Bits and Solid Mortising Chisels figure from their respective lists advanced according to quantity extra basis as above applying on Machine Bits.

Countersinks of the Solid type are always special and therefore do not figure on any quantity extra basis.

Bits having taper shanks, No. 2 Morse Taper or smaller, add \$1.80 per dozen net, minimum charge 45c; for larger shanks add \$3.00 per dozen net, minimum charge 75c. For shank longer than 3 inches or with round shaft between twist and shank, add 7c net per inch. This is in addition to quantity extras as above.

For turning the shanks to smaller diameter on any stock Bits add 60c per dozen, minimum 15c. Cutting off shanks to shorter lengths adds 30c per dozen, minimum charge 8c. The additions as outlined in this paragraph do not apply when ordered in lots of two dozen or more.

Modifying Stock Bits to have brad point, or removing spurs on the No. 150 making into No. 153 Flat Cut Machine Bits adds 10c net each. Reducing size of point or changing pitch of thread on stock tools adds 60c per dozen, minimum charge 15c, figuring on stock Machine Bit basis.

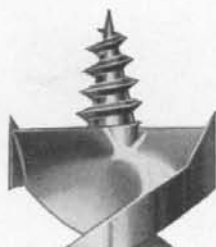
Left Hand Bits or Drills are specials. For quantity of one or two add quantity extras, for three or more add 50% to list.

The minimum charge for any special Bit is \$2.00.



No. 150 Double Spur Machine Bit

THIS No. 150 Double Spur is the general purpose bit and our principal stock is carried in this pattern. It will bore rapidly and sufficiently smooth for any purpose except possibly the most exacting requirements such as some kinds of cabinet work.



Both the lips and cutting edges are carefully proportioned for rapid, easy, smooth cutting but they are so constructed as to give the maximum stock for wear and sharpening.

This pattern is best known and consequently the operator is usually well informed on how to keep the tool in the most approved condition. It is adapted for a wide variety of work and has long life.

We stock this bit with double screw point on the smaller sizes and with single screw point on larger sizes. On sizes and lengths most generally used in car shop work, we furnish with coarse single screw point for fast feed.

This form of cutting head is easily sharpened with a square or flat file of medium cut. File through the throat and on the inside of spurs, never on the outside. The best sharpening instruction is to follow the original lines using a new bit as a guide.

Code word for this pattern, SEMBLANT

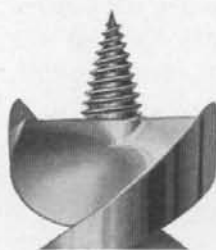
Stock assortment is shown page 29. For specials see page 31.

For price list see page 30.



No. 151 Extension Lip Machine Bit

ABOVE pattern of bit is preferred by many who desire to do particularly smooth boring as in furniture and cabinet work. The No. 151 Extension Lip Pattern Machine Bit will do smoother work than any other type or pattern now on the market.



The spur outlines the hole by severing the fibres of the wood and loosens the stock to be removed by the cutting edge on opposite side of head. When the stock is removed by the cutter there is no tearing of wood and smooth work results.

If the bit is drawn in too rapidly there is a possibility of cutting beyond the portion outlined by spurs with very ragged work resulting.

Too coarse a screw point, therefore, is not recommended in connection with this pattern. On our stock bits we make with a medium slow screw point best suited for the work in which this bit is more generally used. On the smaller sizes we regularly make for stock with double screw point and on larger sizes having more body in the point we make with single screw.

Specials may be made up to order with screw point of coarser or finer pitch of point or with brad point. We can also make with long or short lengths of twist or of varying shank specifications.

Code word for this pattern, SEMBLING.

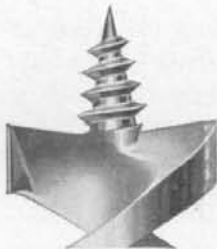
For stock assortment see page 29. For specials see page 31.

Page 30 shows price list.



No. 152 Acme Machine Bit

THE Acme Machine Bit is a type well adapted for use in any of the hard and kiln dried woods. The cutting edges are inclined from the axis of the tool so that the outer points cut in advance of the portions of the edges near the base of the screw.



The feature of this pattern is that the extreme cutting edges outline the circle and pass through the wood before the base of the screw forces out the stock of the center. Thus in cutting through it tears out less stock than other types.

The Acme pattern bits being without cutting spurs do not have any thin projecting part to heat or burn, insuring longer life in hard woods.

Stock bits which we carry are designed principally for use in the medium and high speed machines. These have fine pitch of single screw except on the smaller sizes which have double screw point.

This pattern of bit is well suited for use in gang boring machines where a number of bits are being used and where question of power must be taken into consideration. Being without cutting spurs, the Acme bits require less power in boring than any of the other types.

Code word for the Acme pattern is SEMESTER.

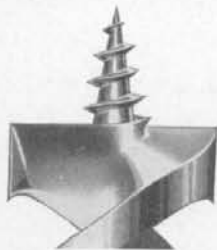
See page 29 for stock carried and for specials page 31.

Page 30 shows price list.

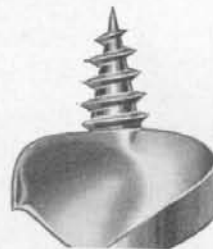


No. 153 Flat Cut Machine Bit

FLAT Cut Machine Bits are similar to the Double Spur pattern except they are without cutting spurs to outline hole. Used principally in end boring where there are no cross fibres to cut. Not carried in stock but can supply promptly by filing spurs off of No. 150. See page 31.



No. 153 FLAT CUT



No. 154 ROUND CUT

No. 154 Round Cut Machine Bit

THE No. 154 Round Cut Machine Bits are used to a large extent for angle boring as the shape of cutting edges allows the screw point to obtain a better grip before cutters actually come in contact with the wood.

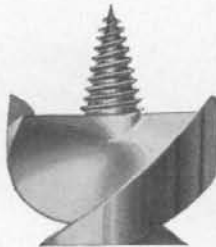
Not carried in stock. See page 31 on specials.

Price list shown page 30.



No. 155 Solid Center Machine Bit

ON account of greater stiffness and strength, the Solid Center type is preferred to the Double Twist type in some classes of work. The single spiral or twist formed around the center stem gives increased room for chip clearance.



The No. 155 Solid Center Machine Bit has cutting edges of the Extension Lip pattern with two cutters, but the twist supporting one of these terminates directly back of the head.

The stem or solid center is a round section continuing through the bit from point to shank. It increases in size toward the shank allowing good clearance where needed and heaviest body of stock where strain occurs.

The No. 155 Solid Center Machine Bit is practical whenever requirements demand a tool of greater strength. For the more general work, however, we would refer to our No. 150 Double Spur pattern in which we carry a wider range of stock.

This style of bit with cutting edges as shown is more generally used but also can be furnished with any of the other types of cutting parts as shown on opposite page.

Code word for this pattern, SEMIVOWEL.

We carry in stock as shown page 29. For specials see page 31.

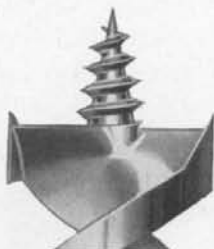
See page 30 for price list.



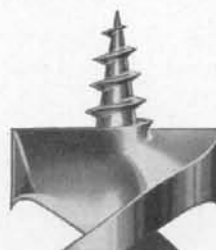
No. 156 $\frac{1}{2}$ Solid Center Machine Bit

THE No. 156 $\frac{1}{2}$ Solid Center Machine Bits are of Flat Cut pattern similar to the No. 156 but without the cutting spurs. The Acme and Round Cut patterns can also be furnished.

Not carried in stock. See page 31 on specials. Price list on page 30.



No. 156 DOUBLE SPUR



No. 156 $\frac{1}{2}$ FLAT CUT

No. 156 Solid Center Machine Bit

SOLID Center Machine Bits are more regularly used with cutting parts as on our No. 155 shown on opposite page. The No. 156 type is similar in the twist but has cutting edges of the Double Spur pattern.

Not carried in stock. See page 31 on specials, page 30 for list.



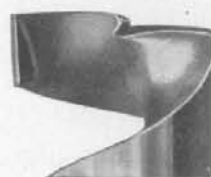
No. 157 Ship Auger Machine Bit, with Screw

THE single twist or spiral with the single cutter makes a stiff strong tool, yet having the most ample chip clearance. It is particularly suited for boring to extreme depths and well adapted for use in portable boring machines in car shop work. Furnished with jappanned twist, or at 10% advance if with polished hollows of twist.

Not carried in stock. See page 31. Code, SEMINOLE.



WITH SCREW



WITHOUT SCREW

No. 158 Ship Auger Machine Bit, without Screw

SIMILAR to No. 157 except not having screw point. There is less tendency of leading off with the grain in deep boring. For list add 20% to that shown on page 30. See page 31 on specials.

Not carried in stock.



DOUBLE SCREW



COMPARISON



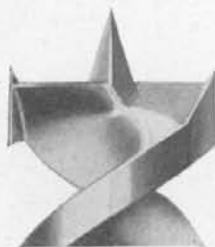
SINGLE SCREW

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 of the work.

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, but without changing the pitch of the thread.

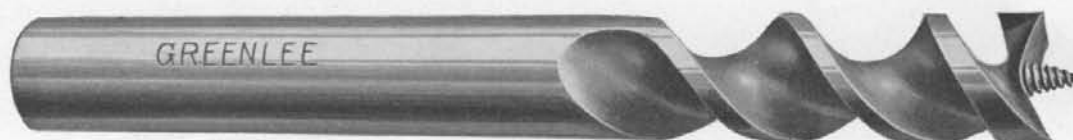
A No. 12 double screw and a No. 12 single screw will bore at exactly the same speed, providing the wood is such that bits follow the natural feed of the points. Yet the former will register with a No. 24 screw pitch gauge while the latter agrees with a No. 12.



BRAD POINT

The double screw point is regularly made on all stock bits in the smaller sizes as the amount of stock in the point will not permit the deeper threads essential to a single screw. Stock Machine Bits in medium and large sizes have single screw point.

Bits having brad point are not carried in stock but any tools in stock with screw point can be filed to brad point for prompt shipment. See page 31 for price.



No. 160 Felloe Boring Bit

AS THE name denotes Felloe Bits are designed especially for use by the wheel makers in felloe boring. The twist is made 2 inches long and with shank $\frac{1}{2}$ -inch diameter 3 inches long. Cutting edges are of the Acme pattern.

The screw point is of fine pitch with double screw threads. The body of stock in the point is so shaped to withstand breakage and to assist in feeding the bit and at the same time slender enough to avoid checking and splitting the rims.

Felloe Bits are frequently used for other purposes. They are serviceable whenever it is desired to bore holes of moderate depth in light stock without splitting and tearing out seriously when boring through. The Acme pattern of cutting edges makes this tool very desirable for use in the harder woods.

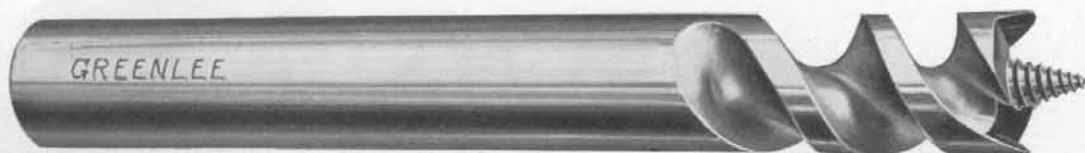
Listed sizes carried in stock.

Other sizes special, see page 31.

LIST PRICE PER DOZEN

Sizes in Sixteenths

Size	6	7	8	9
Code	SCATCHES	SCATHING	SCATHLY	SCATHOLD
Price	\$10.80	10.80	10.80	12.00
Size	10	11	12	14
Code	SCOTLAND	SCOTTER	SCATULA	SCATULUM
Price	\$13.20	14.40	15.60	18.00



Relishing Bit

No. 161, $\frac{3}{8}$ SHANK

No. 162, $\frac{1}{2}$ SHANK

THE No. 162 Relishing Bit has cutting edges of the Extension Lip pattern with the twist $1\frac{1}{2}$ inches long and with shank $\frac{1}{2}$ -inch diameter $3\frac{1}{2}$ inches long, making overall length of about $5\frac{1}{4}$ inches including the screw point.

No. 161 Relishing Bit is similar with shank $3\frac{1}{2}$ inches long, $\frac{3}{8}$ -inch diameter for one-half its length and tapering to the diameter of the twist for the remaining half. This tapering section is intended to give added strength.

The older Greenlee Relishing Machines require the No. 161 and later type machines our No. 162. Where sockets on machines do not agree with shanks on stock tools it is advisable to bore out or bush same to standard. Turning down the shank to smaller diameter will allow these stock bits being used in other machines, this at only a small added cost.

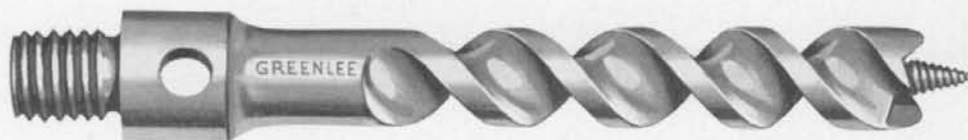
Sizes as listed carried in stock.

See page 31 on specials.

LIST PRICE PER DOZEN

Sizes in Sixteenths

Size	6	7	8	9	10	12
No. 161	SCARABS	SCARELY	SCARCITY	SCAREBUG	SCARFIND	SCARIFY
No. 162	SCARIONS	SCARITID	SCARLESS	SCARNBEE	SCARPED	SCARVES
Price	\$10.80	10.80	10.80	12.00	13.20	15.60



No. 163 and 164 Screw Shank Dowel Bits

No. 163, $\frac{5}{16}$ xNo. 20 THREAD

No. 164, $\frac{7}{16}$ xNo. 14 THREAD

THE sockets of most machines using this type answer to one of two standards—either $\frac{5}{16}$ -inch diameter with No. 20 thread or $\frac{7}{16}$ -inch diameter No. 14 thread. All stock tools measure $4\frac{1}{2}$ inches long overall and are of the Extension Lip pattern. The length is made up of $\frac{1}{2}$ -inch threaded shank $\frac{1}{2}$ -inch shoulder, about $\frac{1}{2}$ -inch round and the balance twist and screw point.

Accuracy is a particular requirement of any dowel bit. Our screw Shank Dowel Bits are sized with the same care that is used in all GREENLEE Bits and to exact indicated diameter. Dowel rods should be sized with corresponding accuracy, and if variation occurs, it should be noted in ordering bits.

Specials in larger sizes, longer or shorter lengths or of different style may be made up promptly, the cost depending on quantity of each size ordered as referred to on page 31.

Stock is carried only in sizes $\frac{1}{2}$ -inch and smaller.

LIST PRICE PER DOZEN

Sizes in Sixteenths

Size	3	4	5	6	7	8
Code No. 163	SCHAPPE	SCHEDULE	SHELLY	SCHEMER	SCHEMIST	SCHEPEN
Code No. 164	SCHUIT	SCHULE	SCHULTENS	SCHUNGITE	SCHUTE	SCHWANN
Price	\$7.20	7.20	7.20	7.20	7.20	7.20
Size	9	10	11	12	14	16
Code No. 163	SCHERZO	SCHILBE	SCHILLER	SCHISMA	SCHOLAR	SCHOOLS
Code No. 164	SCHWARZ	SCHWATKA	SCHWYZ	SCHWELM	SCHWERIN	SCHWEGLER
Price	\$7.60	8.00	8.50	9.00	10.20	11.40



No. 178 and 178½ Screw Shank Dowel Drills

No. 178, 5/16xNo. 20 THREAD

No. 178½, 7/16xNo. 14 THREAD

SCREW Shank Dowel Drills our Nos. 178 and 178½ are carried in stock, sizes 8/32, 10/32, 12/32, 14/32 and 16/32 with an overall length of 4½ inches. This length is made up of ½-inch threaded shank, shoulder 3/8-inch long, round shaft about ¼-inch long, the balance twist. Other sizes and lengths special, see page 31.

Nos. 179 and 179½ Screw Shank Dowel Drills correspond with the above with the exception that they have brad point and spurs similar to our No. 177 as shown on page 45. Not carried in stock. See page 31 covering special tools. Use code below adding word "Brad Point."

LIST PRICE EACH

Sizes in Thirty-seconds

Size	4	5	6	7	8	9
Code No. 178	SCOBINA	SCOCHON	SCOFFERS	SCOFFING	SCOGANLY	SCOLAIE
Code No. 178½	SCORBUTIC	SCORBUIUS	SCORCH	SCORCHING	SCORDIUM	SCORIA
Price	\$1.05	1.05	1.05	1.05	1.05	1.05
Size	10	11	12	13	14	15
Code No. 178	SCOLDER	SCOLDING	SCOLECES	SCOLESIS	SCOLIAST	SCOLION
Code No. 178½	SCORKLE	SCORNER	SCORPENE	SCORPHID	SCORPION	SCORPIOYD
Price	\$1.05	1.10	1.13	1.17	1.20	1.25
Size	16	17	18	20	22	24
Code No. 178	SCOLLARD	SCOLYTUS	SCOMBER	SCOOPER	SCOPIOUS	SCOPPET
Code No. 178½	SCOTTER	SCOTFREE	SCOTIA	SCOTICE	SCOTINO	SCOTISM
Price	\$1.28	1.35	1.43	1.58	1.72	1.88



Machine Drill List

LIST PRICE EACH

SIZES IN THIRTY-SECONDS

Size 32nd	4-inch Twist	6-inch Twist	8-inch Twist	10-inch Twist	12-inch Twist	Each Extra Inch of Twist
6	\$.90					\$.15
7	.90					.15
8	.90					.15
9	.90					.15
10	.90	\$1.20				.15
11	.95	1.25	\$1.55			.15
12	1.00	1.30	1.60	\$1.90	\$2.20	.15
13	1.10	1.40	1.70	2.00	2.30	.15
14	1.15	1.45	1.75	2.05	2.35	.15
15	1.25	1.55	1.85	2.15	2.45	.15
16	1.30	1.60	1.90	2.20	2.50	.15
17	1.40	1.70	2.00	2.30	2.60	.15
18	1.50	1.80	2.10	2.40	2.70	.15
19	1.60	1.92	2.24	2.56	2.88	.16
20	1.70	2.04	2.38	2.72	3.06	.17
21	1.80	2.16	2.52	2.88	3.24	.18
22	1.90	2.28	2.66	3.04	3.42	.19
23	2.00	2.40	2.80	3.20	3.60	.20
24	2.15	2.57	2.99	3.41	3.83	.21
25	2.25	2.69	3.13	3.57	4.01	.22
26	2.40	2.88	3.36	3.84	4.32	.24
27	2.55	3.05	3.55	4.05	4.55	.25
28	2.65	3.17	3.69	4.21	4.73	.26
29	2.80	3.36	3.92	4.48	5.04	.28
30	2.95	3.53	4.11	4.69	5.27	.29
31	3.10	3.72	4.34	4.96	5.58	.31
32	3.25	3.89	4.53	5.17	5.81	.32
33	3.40	4.08	4.76	5.44	6.12	.34
34	3.55	4.25	4.95	5.65	6.35	.35
36	3.90	4.68	5.46	6.24	7.02	.39
38	4.25	5.09	5.93	6.77	7.61	.42
40	4.60	5.52	6.44	7.36	8.28	.46
42	5.00	6.00	7.00	8.00	9.00	.50
44	5.40	6.48	7.56	8.64	9.72	.54
46	5.80	6.96	8.12	9.28	10.44	.58
48	6.20	7.44	8.68	9.92	11.16	.62



No. 176 Taper Head Drill

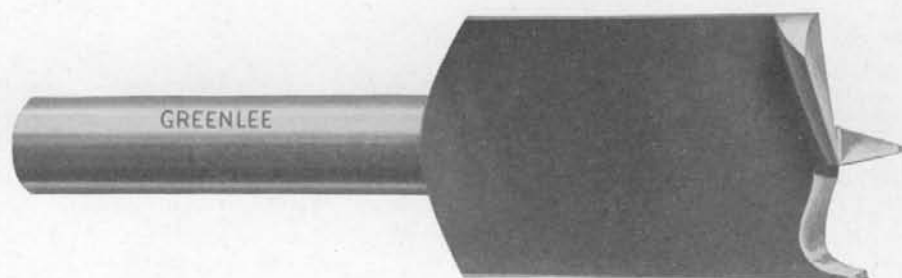
TAPER Head Drills for wood are suitable for manufacturers of furniture, implements and auto bodies. The longer lengths are generally used in car repairs where they give excellent results in boring where nails may be encountered, as contact with metal does not seriously damage cutting parts.

Stock is carried with 4-inch twist, $\frac{1}{2} \times 2\frac{1}{4}$ -inch shank sizes $\frac{9}{32}$ to $\frac{15}{32}$. Other sizes and lengths special, see page 31. For list see page 44.



No. 177 Spur Machine Drill

THIS pattern has cutting spurs and brad point boring somewhat smoother than the No. 176. Stock is carried sizes $\frac{9}{32}$ to $\frac{15}{32}$ with 4-inch twist $\frac{1}{2} \times 2\frac{1}{4}$ -inch shank. Other sizes and lengths special, see page 31. For list see page 44.



No. 169 Machine Center Bit

CENTER Bits are primarily intended for boring shallow holes of large diameter in light stock. They are fitted with brad points unless otherwise specified. Length of blade is 2 inches on sizes 2-inch and smaller, larger sizes having length of blade equal to diameter.

We can supply Center Bits for countersinking and can recommend this tool wherever the depths are within its range. The shape of the cutting edges allow the maker to work out special forms of countersink Center Bits which would not be possible with any other type.

Sizes $\frac{3}{4}$ -inch to $2\frac{1}{2}$ -inch carried in stock with $\frac{1}{2} \times 2\frac{1}{4}$ -inch shank. Other sizes special see page 31.

LIST PRICE EACH

Size	$\frac{1}{2}$ "	$\frac{5}{8}$ "	$\frac{3}{4}$ "	$\frac{7}{8}$ "	1"	$1\frac{1}{4}$ "
Code	SELF CARE	SELF EASE	SELF HEAL	SELF HELP	SELF HOOD	SELF HOPE
Price	\$.60	.85	1.10	1.35	1.60	1.95
Size	$1\frac{1}{2}$ "	$1\frac{3}{4}$ "	2"	$2\frac{1}{4}$ "	$2\frac{1}{2}$ "	$2\frac{3}{4}$ "
Code	SELF LEFT	SELF LESS	SELF LIKE	SELF LOVE	SELF MADE	SELF NESS
Price	2.30	2.65	3.00	3.35	3.70	4.05
Size	3"	$3\frac{1}{4}$ "	$3\frac{1}{2}$ "	4"	$4\frac{1}{2}$ "	5"
Code	SELF RULE	SELF ACTING	SELF SAME	SELF SOWN	SELF VIEW	SELF WILL
Price	\$4.40	4.90	5.40	6.40	7.70	9.00



No. 180 Countersink Machine Bit

COUNTERSINK Machine Bits are very economical wherever concentric holes of varying diameters are required. Their use in such cases avoids at least one handling of stock, and usually permits of better work being done. The original cost of these special tools is small in comparison with the saving thus effected.

The No. 180 Countersink Machine Bit shown above has both cuts of the double spur pattern, and is one of the most commonly specified. Our No. 181 is similar except that the larger diameter cuts a bevel to correspond to a screw head.

Where Countersink Machine Bits are to be used in car shops we fit them with coarse screw point for fast boring. These tools being special, same can be supplied with any practical pitch of point.

Countersinks are of such special nature that in ordering, the fullest specifications should be given. The dimensions necessary are: diameter and length of larger twist, diameter and length of smaller twist, diameter and length of shank. At the same time, the type and pattern should be noted applying to both the larger and smaller cuts or diameters.

The list price of countersinks of all types is based on the machine bit list shown on page 30. In obtaining this, the lead and counter are figured as separate machine bits and the lists added to make the list for the combined tool.

Not carried in stock.



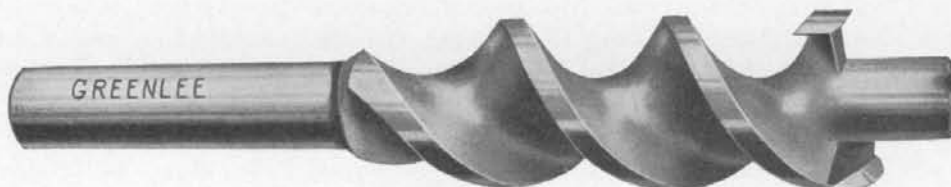
No. 182 Countersink Bit and Drill

BEVEL BIT COUNTER

TAPER HEAD DRILL LEAD

OUR No. 182 Countersink is recommended for use when it is desired to bore for wood screws and set in screw head to a considerable depth. Specify length and diameter of each part, also of shank.

Not carried in stock. Consider each part as a separate bit, list page 30.



No. 189 Counterbore Machine Bit

DOUBLE SPUR COUNTER

PLUG OR PILOT LEAD

COUNTERBORES are intended for enlarging holes already bored. Consider the pilot and counter as separate machine bits, the combined list being the list applying on the Counterbore.

Not carried in stock See page 30 for list.



No. 185 Countersink Drill

THE No. 185 Countersink Drill is a tool well adapted in the boring and countersinking for setting of wood screws. The bevel cut on the counter corresponds to the taper on the head of the screw. It is a tool easily sharpened and can easily be kept in serviceable condition.

When ordering it is essential that complete specifications be given as the tools must be made up to order. Note on order the diameter and length of the lead or smaller part, diameter and length of the counter or larger part, also the diameter and length of the shank.

On pages 51 and 52 we show somewhat similar Countersinks except that the drill lead is removable and adjustable. However, the split shank type with the removable inside drill is not always suitable for the work. The solid type as illustrated above is desirable where the conditions are not severe and where breakage is not encountered.

Our No. 186 Countersink Drill has both the lead and the counter similar to our No. 177 Spur Machine Drills page 45. This type will bore flat bottom holes the same as the No. 180 and is preferable on countersinks in the smaller sizes.

To obtain list on any Countersinks of the solid type we consider the lead and the counter as separate machine bits, using the Machine Bit list page 30, the combined list being the list applying on the Countersinks.

Not carried in stock.



No. 188 Split Shank Countersink

THE No. 188 Countersink has split shank $\frac{1}{2} \times 1\frac{1}{2}$ -inch and overall length of 4 inches. All $\frac{1}{2}$ inch sizes are made with solid center twist to give added chip clearance. Carried in stock sizes $\frac{3}{4}$ -inch and smaller as listed, larger sizes special, see page 31. Drills are sold separately.

LIST PRICE EACH WITHOUT DRILL

Size	Price
$\frac{1}{2}$ -inch.....for $\frac{1}{8}$, $\frac{3}{16}$, $\frac{7}{32}$, or $\frac{1}{4}$ -inch drills.....	\$4.00
$\frac{9}{16}$ -inch.....for $\frac{7}{32}$ or $\frac{1}{4}$ -inch drills.....	4.25
$\frac{5}{8}$ -inch.....for $\frac{3}{16}$, $\frac{7}{32}$, $\frac{1}{4}$, $\frac{9}{32}$ or $\frac{5}{16}$ -inch drills.....	4.50
$\frac{3}{4}$ -inch.....for $\frac{1}{4}$, $\frac{9}{32}$, or $\frac{5}{16}$ -inch drills.....	5.50
$\frac{7}{8}$ -inch.....for any practical size drill.....	6.25
1-inch.....for any practical size drill.....	7.00
$1\frac{1}{8}$ -inch.....for any practical size drill.....	7.75
$1\frac{1}{4}$ -inch.....for any practical size drill.....	8.50
$1\frac{1}{2}$ -inch.....for any practical size drill.....	10.00



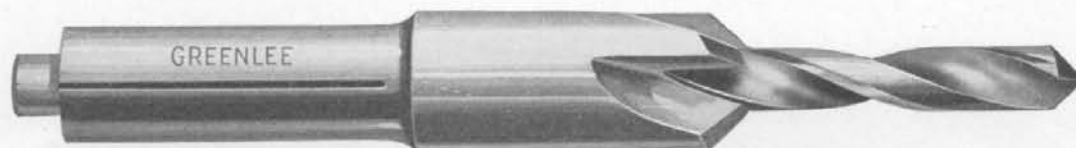
No. 175 Straight Shank Drill

OUR No. 175 Drills have $2\frac{1}{2}$ -inch twist, straight shank $3\frac{1}{2}$ inches long, 6 inches overall for use in No. 188 Countersinks and also can be used with the No. 188 $\frac{1}{2}$ or No. 187 types.

Sizes as listed carried in stock.

LIST PRICE EACH

Size	$\frac{1}{8}$ "	$\frac{3}{16}$ "	$\frac{7}{32}$ "	$\frac{1}{4}$ "	$\frac{9}{32}$ "	$\frac{5}{16}$ "
Price	\$.60	.65	.65	.65	.70	.75



No. 188 $\frac{1}{2}$ Split Shank Countersink

OUR No. 188 $\frac{1}{2}$ Countersinks are made with 3 cutters, overall length of 3 inches and have $\frac{1}{2} \times 1\frac{1}{2}$ -inch split shank. The bevel cut corresponds to the taper on the head of a wood screw. The inside drill is readily replaced if broken or worn out. Drills are sold separately, see our No. 175 or No. 175 $\frac{1}{2}$.

These are carried in stock as listed.

LIST PRICE EACH WITHOUT DRILL

Size	Price
$\frac{1}{2}$ -inch.....for $\frac{1}{8}$, $\frac{5}{32}$, $\frac{3}{16}$, $\frac{7}{32}$ or $\frac{1}{4}$ -inch drills.....	\$3.00
$\frac{5}{8}$ -inch.....for $\frac{9}{32}$ or $\frac{5}{16}$ -inch drills.....	3.50



No. 175 $\frac{1}{2}$ Straight Shank Drill

STRAIGHT Shank Drills, No. 175 $\frac{1}{2}$, are used in No. 188 $\frac{1}{2}$ or No. 187 Countersinks. The twist is 2 inches long with overall length of 4 $\frac{1}{2}$ inches.

Sizes as listed carried in stock.

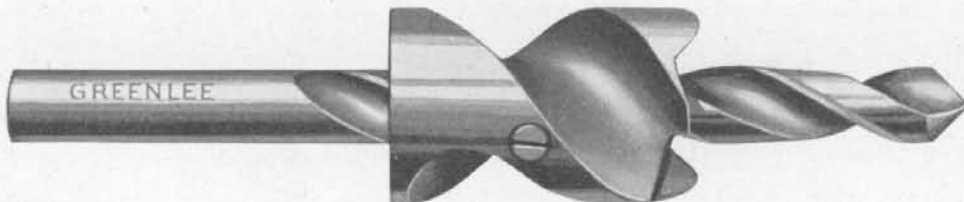
LIST PRICE EACH

Size	$\frac{1}{8}$ "	$\frac{5}{32}$ "	$\frac{3}{16}$ "	$\frac{7}{32}$ "	$\frac{1}{4}$ "	$\frac{9}{32}$ "	$\frac{5}{16}$ "
Price \$	.50	.50	.55	.55	.55	.60	.65



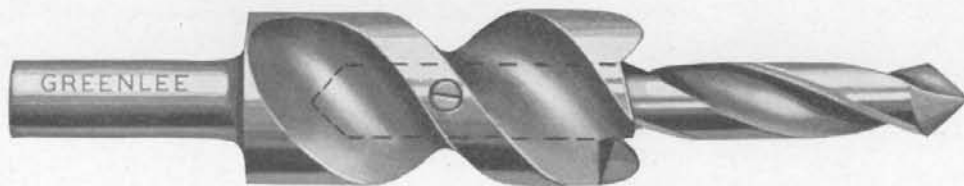
No. 187 Split Shank Countersink

THIS new style of Split Shank Countersink has fluted twist for elevating chips and is recommended for work beyond the range of the No. 188½ style. For list price see page 51.



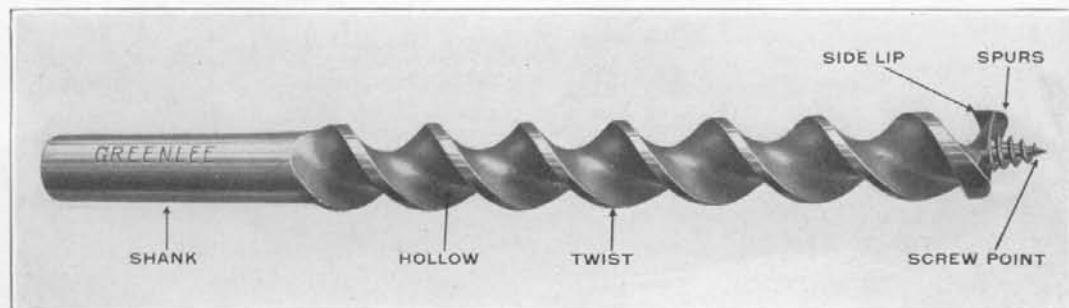
No. 192 Adjustable Countersink Cutter

THE Countersink Cutter above illustrated fastens on the twist of a Drill by means of a headless set screw and is readily adjusted for various depths of boring. This type is recommended for sizes where the split shank type is not practical. See page 50 for list on countersinks and page 44 for drills.



No. 193 Inserted Lead Countersink Cutter

THIS pattern of Countersink is preferred by some users on sizes where the split shank type is not practical. The shank and countersink are solid, the lead drill being inserted and held securely by headless set screw. For list price on countersinks see page 50 and page 44 for drills.



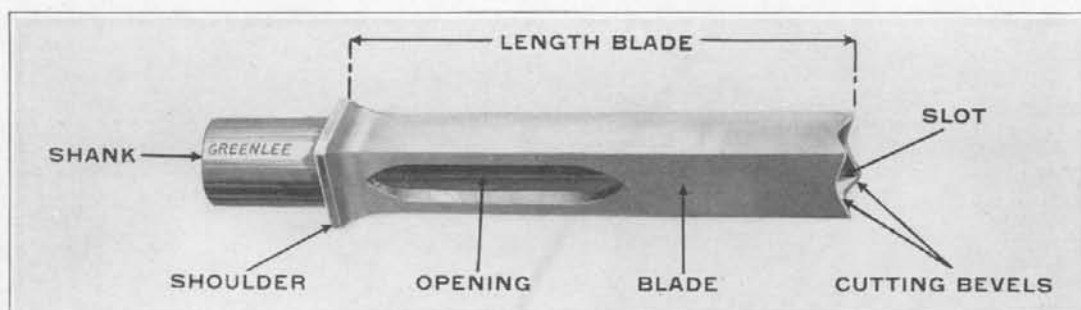
PARTS OF A MACHINE BIT

WHERE difficulties are encountered we offer our assistance based on over fifty years experience in the making of mortising and boring machines, and the tools used in same.

Write us fully regarding your work, noting make and style number of your machine, kind of wood being used, depth of boring or mortising, speed of machine, etc.

Greenlee Bits and Chisels are fully guaranteed against all defects of both material and workmanship and we stand ready to back our product to the fullest extent.

Obtain the Bits or Chisels designed to suit your own particular requirements as a slight change in the type of tool oftentimes makes a decided difference in results obtained.



PARTS OF A HOLLOW CHISEL



IN THIS catalog we have illustrated and listed the various tools manufactured by us for machine use. Our line also includes Augers, Auger Bits, Car Bits, Socket and Tang Chisels and Gouges, Turning Tools, Draw Knives and various other tools for hand use. On the following pages we are illustrating the principal numbers and if further information is desired regarding these tools we would be very glad to mail catalog listing and describing this portion of our line.



No. 12 Extension Lip Auger Bit

3-5" TWIST

7-9½" OVERALL



No. 22 Solid Center Auger Bit

3-5" TWIST

7-9½" OVERALL



No. 39 Ship Auger Bit

3-5" TWIST

7-9½" OVERALL



No. 46 Wood Boring Brace Drill

2 $\frac{1}{4}$ "-4" TWIST

4 $\frac{1}{2}$ "-8" OVERALL



No. 54 Double Spur Car Bit

12" TWIST

16-17" OVERALL



No. 56 Solid Center Car Bit

12" TWIST

16-17" OVERALL



No. 64 Ship Auger Car Bit

12" TWIST

16-17" OVERALL



No. 66 Ship Auger, with Screw

8-15" TWIST

13-20" OVERALL



No. 68 Ship Auger, without Screw

8-15" TWIST

13-20" OVERALL



No. 59 Solid Center Ship Auger

8-15" TWIST

13-20" OVERALL



No. 88 Nut Auger

6-9½" TWIST

14-20" OVERALL



No. 200 Socket Butt Chisel

3" BLADE



No. 230 Socket Firmer Chisel

6 1/4" BLADE



No. 330 Socket Firmer Gouge

6 1/4" BLADE



No. 400 Tang Butt Chisel

3" BLADE



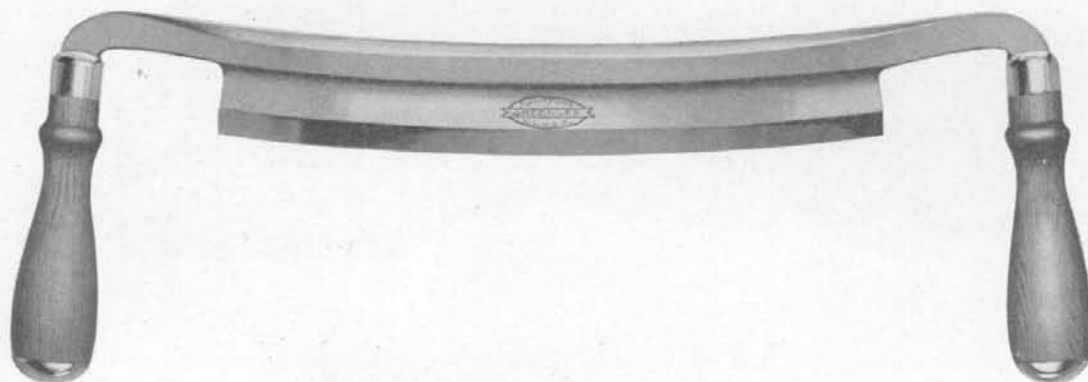
No. 476 Turning Chisel



No. 576 Turning Gouge



No. 596 Parting Tool



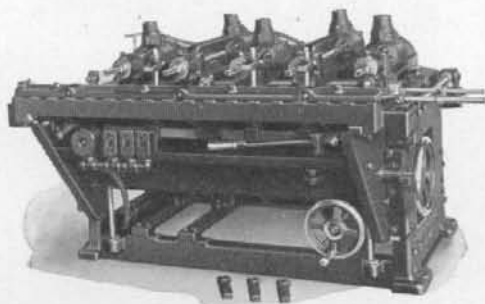
No. 600 Razor Blade Draw Knife



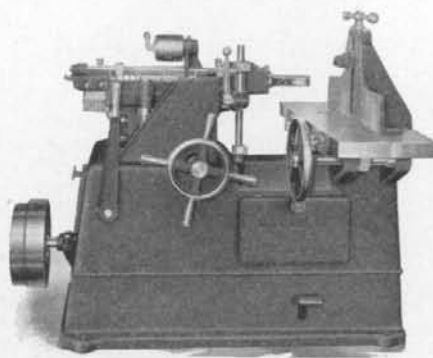
WOODWORKING MACHINERY

THE following machine illustrations are shown simply to suggest the extent of our line, and are not intended to serve as a catalog of this equipment. Mortising and Boring Machines are shown in the majority to emphasize the fact that we are leaders in this field, not only with reference to tools, but from the standpoint of the machines themselves.

In addition to building a complete line of Mortisers and Borers, we have specialized for many years on certain other classes of Woodworking Machinery, some of which are suggested by the illustrations on pages 64 and 65. A separate catalog of this equipment is published by us and will be sent on request.



No. 212-M Multiple Spindle Mortiser
With Built-in Motors



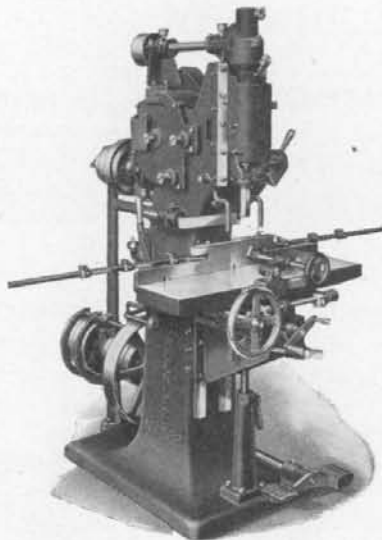
No. 214 Horizontal Mortiser
Chisel Capacity up to $1\frac{1}{2}$ "



No. 225-BM Foot Feed Mortiser
With Built-in Motor
Chisel Capacity up to $\frac{3}{4}$ "



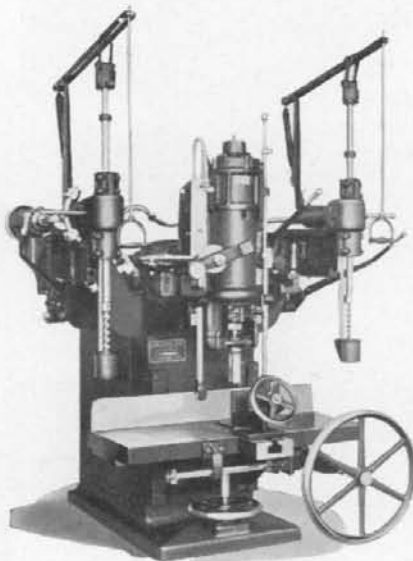
No. 227-BM Power Feed Mortiser
With Built-in Motor
Chisel Capacity up to 1"



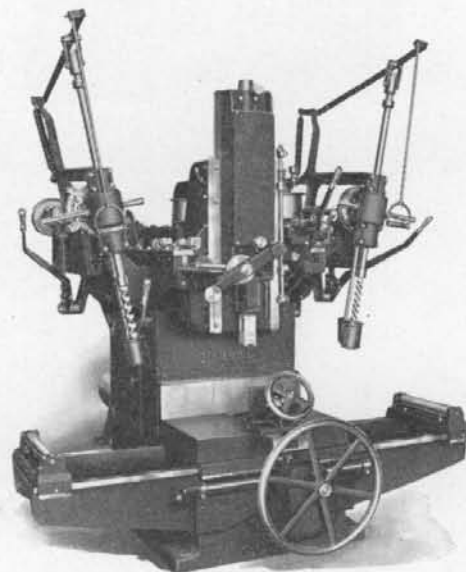
No. 228 Power Feed Mortiser
For Belt or Motor Drive
Chisel Capacity up to 1 1/4"



No. 251 Hinge or Trim Mortiser
For Belt or Motor Drive
A New and Improved Design

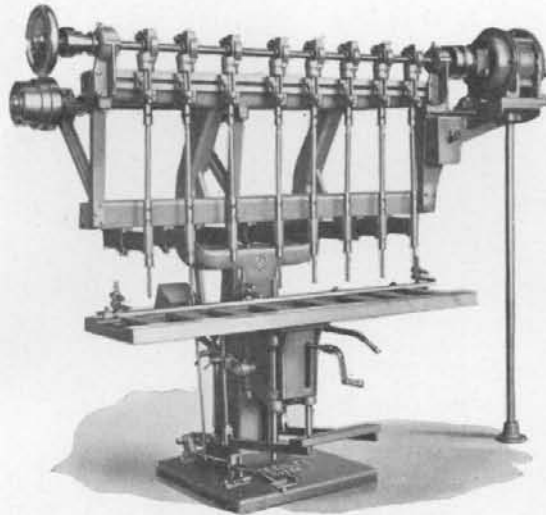


No. 232-MC Car Mortiser
With Built-in Motor
Chisel Capacity up to 2"

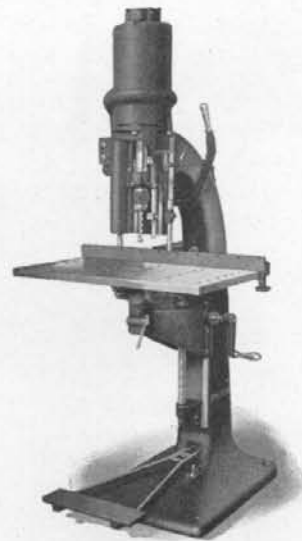


No. 238-C Car Mortiser
For Belt or Motor Drive
Chisel Capacity up to 2 1/2 or 3"

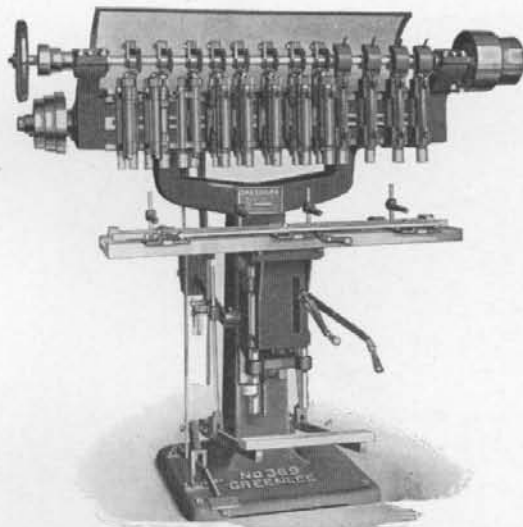
OUR line of Hollow Chisel Mortisers includes all sizes from light foot-feed machines to the extra heavy patterns for car shop purposes. Lack of space prevents showing more than a few representative types, but we build many other patterns to thoroughly meet all mortising needs. The complete line is shown in our machinery catalog which will be sent on request.



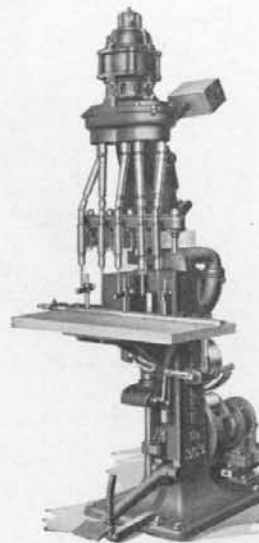
No. 366 Universal Spindle Gang Borer
Built in Lengths from 3 to 6 Feet



No. 356 Single Spindle Borer
With Built-in Motor



No. 369 Gang Borer
Built in Lengths From 2 to 5 Feet

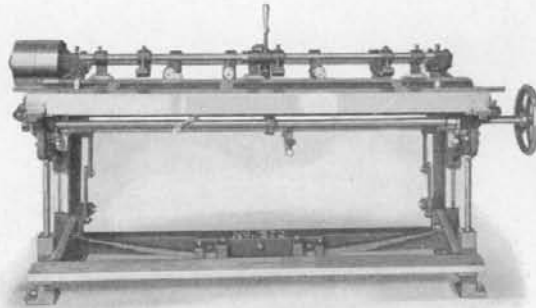


No. 363 Gang Borer
For Belt or Motor Drive

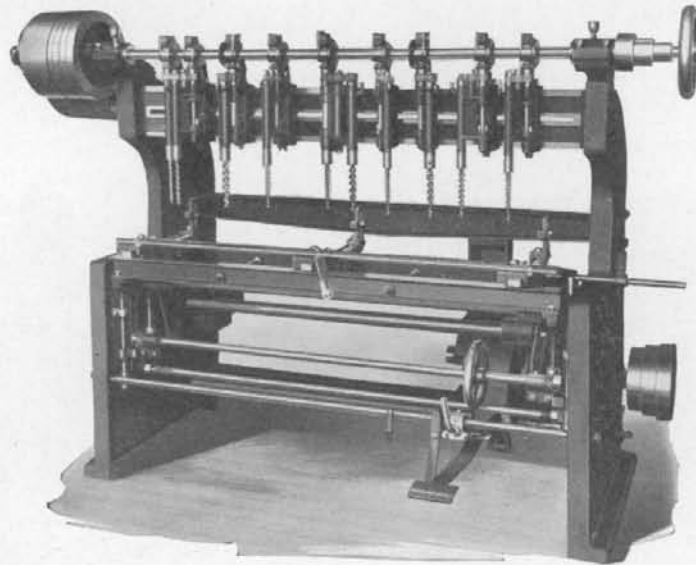
THE machines illustrated on this and the following two pages are representative types selected from our line of Single Spindle Pedestal Borers, Gang Borers and Car Borers. They represent a class of machinery on which we have specialized for a great many years and have developed to a high state of perfection. Many other patterns in both the horizontal and vertical types are built by us to meet the requirements of any class of shop.



No. 368 Gang Borer
Built in 20 and 30" Lengths



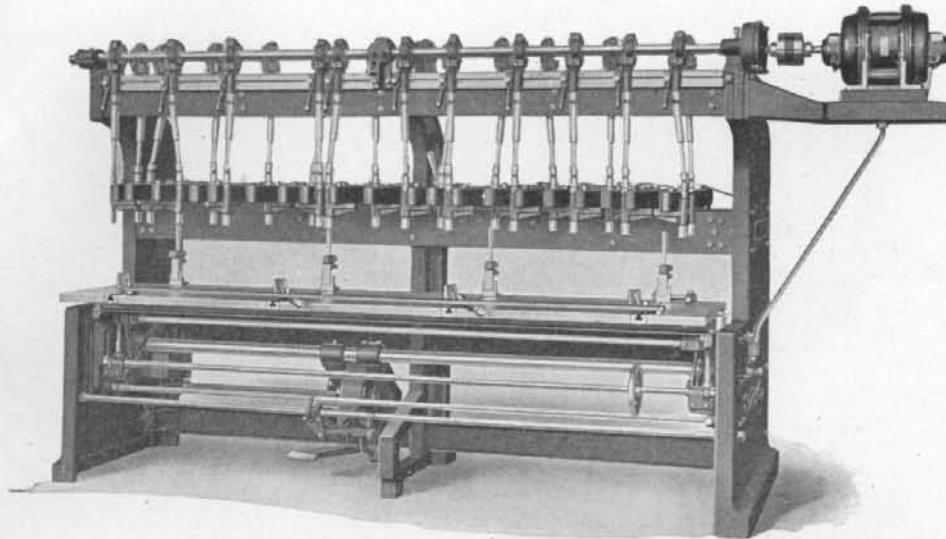
No. 370 Gang Borer
Built in 4, 5 and 6' Lengths



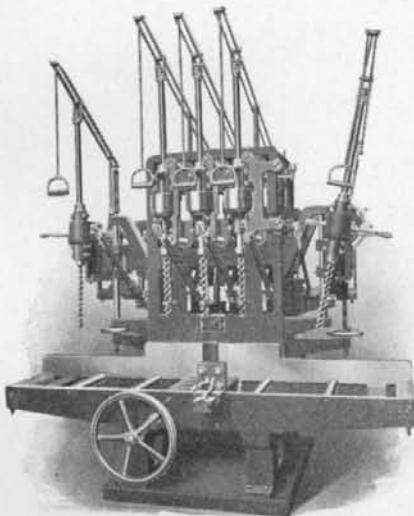
No. 371 Gang Borer
Built in Lengths From 4 to 12 Feet

IT IS true that correctly designed Gang Borers are doing as much to place the woodworking industry on an economical basis as any class of machinery on the market. Great savings are effected in time and labor, since all holes in a piece can usually be bored at one operation, lay-out lines are eliminated and perfect duplication of parts is obtained.

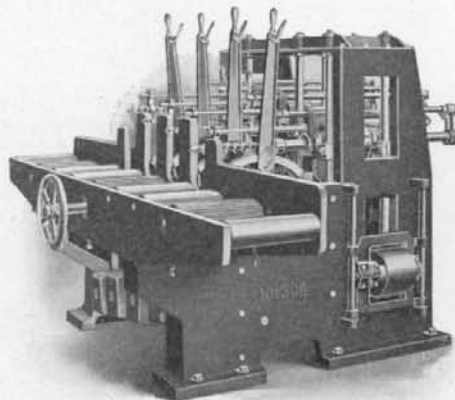
For many years we have made an intensive study of gang boring problems and of the design of machines to properly meet these requirements. Our machines are built in many styles and sizes and each one can be equipped to handle a wide variety of work. These are shown in our catalog which will be sent on request.



No. 386 Universal Spindle Gang Borer
Built in Lengths from 3 to 16 Feet

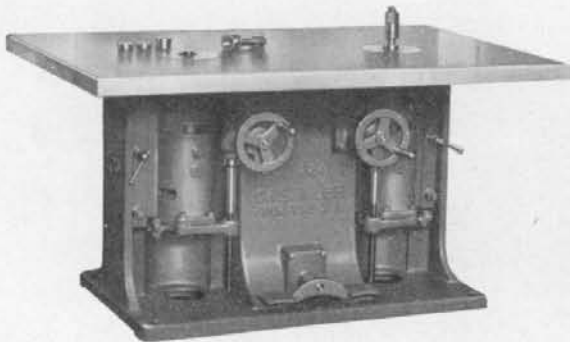


No. 327 Vertical Car Borer



No. 306 Horizontal Car Borer

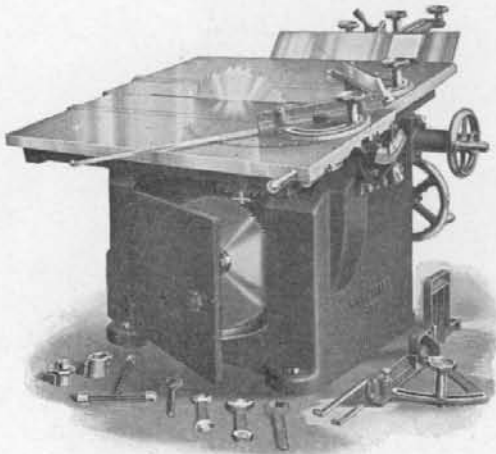
THE two Car Borers shown above have been selected from our complete line of vertical and horizontal machines as representative types. A similar vertical machine is built with four vertical spindles and both patterns can be furnished with or without radial spindles. Traveling timber tables can also be furnished when desired. Our Horizontal Car Borers are built with from two to five spindles. In addition to Borers and Mortisers, our line of Car Shop Machinery includes Tenoners, Gainers, Rip Saws, Cut-off Saws, etc.



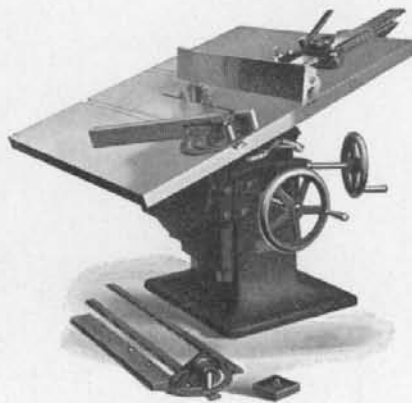
No. 180 Electric Shaper
Spindles 30" Apart



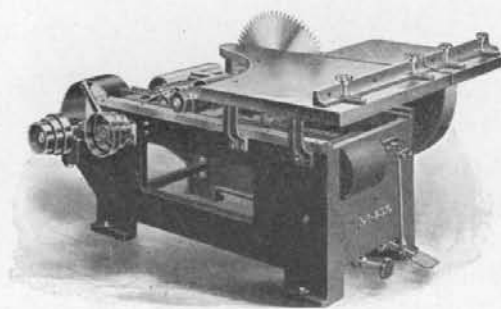
No. 495 Tilting-Arbor Saw
Motor on the Arbor



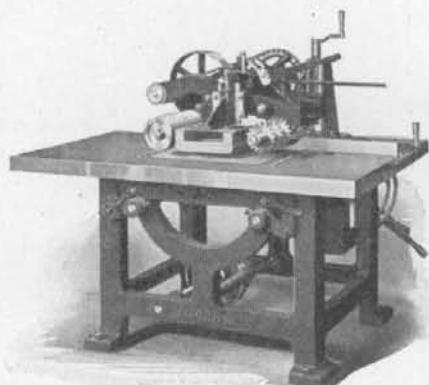
No. 478 Double Arbor Universal Saw
For Belt or Motor Drive



No. 493 Tilting-Table Saw
Motor on Arbor or for Belt Drive

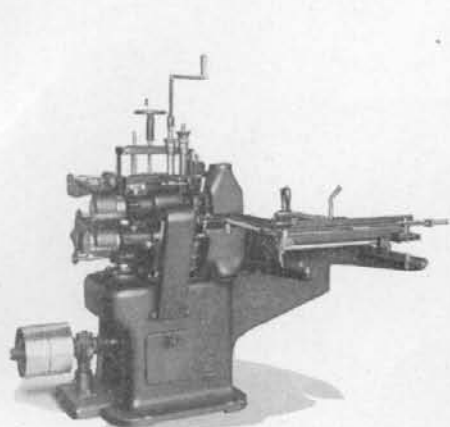


No. 453 Automatic Cut-off Saw

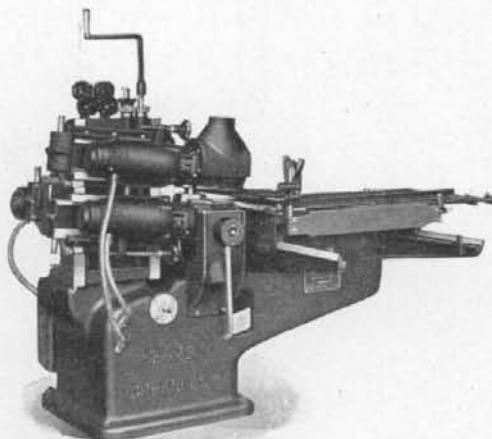


No. 426-G Self-Feed Gang Rip Saw

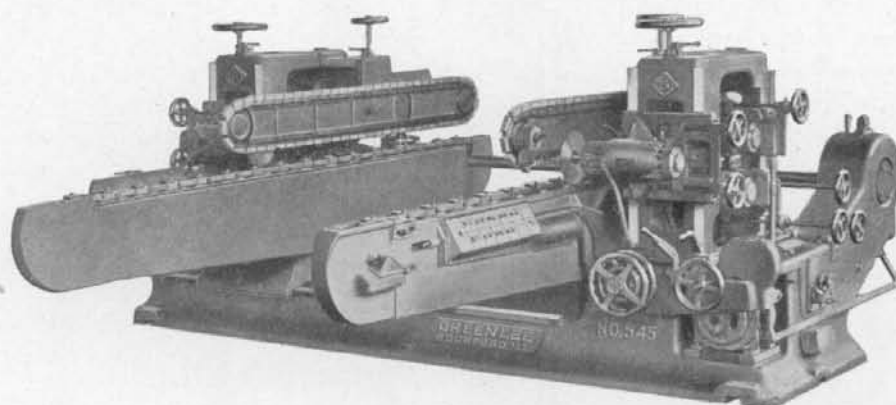
IN ADDITION to Mortisers and Boreers, we build a complete and high-grade line of Sawing Machinery, Tenoners, Shapers, Planers, and special Sash and Door equipment. The illustrations on this and the following pages are but a suggestion of this line. Separate descriptive circulars or a catalog on our complete line of Woodworking Machinery will be sent on request.



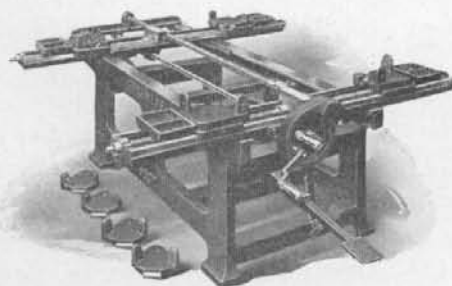
No. 530 Single End Tenoner
For Belt or Motor Drive



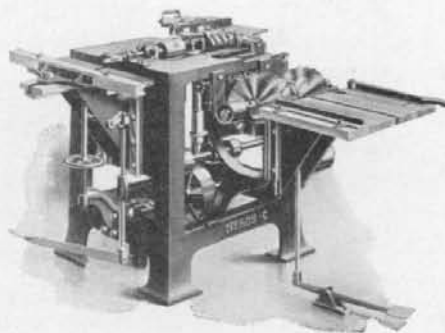
No. 533 Single End Tenoner
With Built-in Motors



No. 545 Electric Double-End Tenoner



No. 602 Sash Clamp



No. 605-C Relisher and Mortiser



No. 720 Hollow Chisel Sharpening Machine

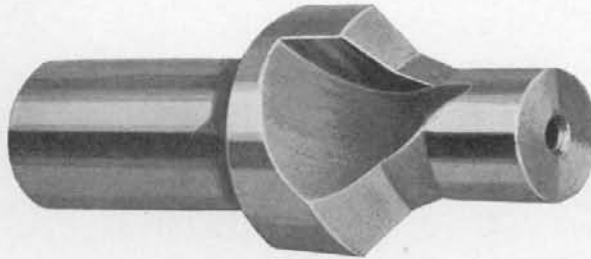
CODE WORD, RUBATO
(Patent Pending)

THE above machine is needed where Hollow Chisel Mortisers are operated as it provides for sharpening hollow chisels otherwise discarded. The cutter shapes the inside of chisel so that bit fits properly, eliminating practically all filing.

Its outstanding features are compactness, portability, ease of operation, and absence of complicated parts. It can be fastened to a bench or bolted to a post in the sharpening room of any wood mill, and you will note from illustration that no belt or motor is required, since it is operated entirely by hand.

The machine occupies 12x13 inches of space, height 28 inches, weight 80 pounds boxed. It will sharpen 5-inch blade hollow chisels and shorter, sizes $\frac{1}{4}$ to $1\frac{1}{4}$ -inch square.

Price quoted on application.

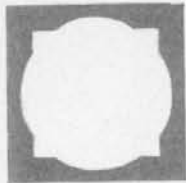


No. 111 Double Angle Cutter

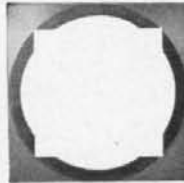
(Patent Pending)

SEPARATE double angle form cutters are required for each size of hollow chisel, due to the different sizes of bore. They can easily be sharpened by grinding the face of the cut so that the form is not changed. Cutters are to be used only on Greenlee Hollow Chisels as we cannot be responsible for them when used in other makes over which we have no control of heat treatment or design.

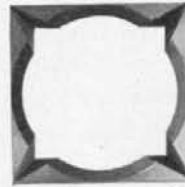
Prices quoted on application.



A



B



C

PREPARING THE CHISEL: Tool being dull, place in machine with the jaws holding the chisel just tight enough to prevent turning around, centering pilot of cutter in bore of chisel by screwing down spindle until the cutter comes in contact with edges of chisel. If corners of chisel break or split, grind or file square at cutting end as in "A" before inserting in machine.

SHARPENING PROCESS: After lowering cutter to contact with chisel, turn crank screwing spindle downward until outside angle of cutter has cut to corner of chisel. Cutter should make a fairly heavy cut, burr being easily removed with file or scraper. Cutting edge now is as in illustration "B".

FINAL STEP: Completing the corners. This is done by grooving them with a square file until they are as shown in illustration "C". Chisel is now in first class condition.



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