

GREENLEE
WOODWORKING
MACHINERY



GENERAL CATALOG
POCKET EDITION

1925

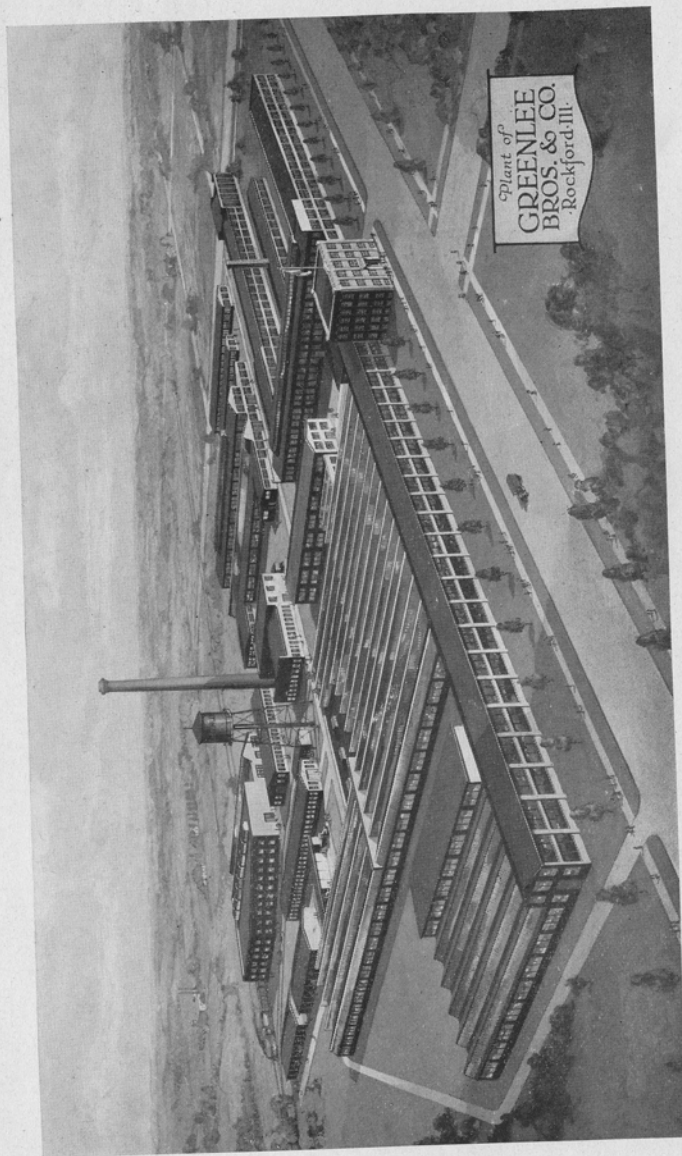
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INTRODUCTION

THE first Pocket Edition Catalog of our standard lines of Woodworking Machinery was prepared and distributed in 1922. That book has proven so satisfactory, both for our customers and ourselves, that this revised edition is now offered as an up-to-date reference catalog of our machinery. Particular attention is called to improved designs in the way of motor driven Mortisers, Tenoners, etc.

Standard Railway Car Shop machines are shown in this catalog, but little description of them is attempted. More complete details are given in our large sectional catalog which will be sent to those interested in such machines. Separate catalogs on our Railway Tie Adzing and Boring machines and on our Mine Timber Framers are also available.

Our Hollow Mortising Chisels and Bits, Machine Bits and Woodworkers' Hand Tools are fully covered in special catalogs, although we illustrate some standard types on the last pages of this book. These are preceded by some illustrations and description of our Vises for Woodworkers.

In no case has it been possible to give more than a general idea of the various points in design and construction which contribute to the success of Greenlee machines. If interested in any particular machines, write us for more complete information. If seeking some machine not illustrated, we also desire your inquiry, as we can often furnish information that will be of assistance.

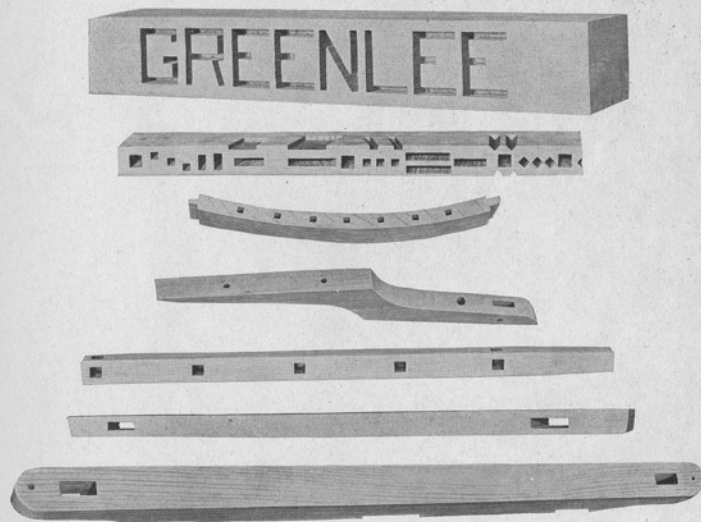


A Heavy Greenlee Mortiser in Action

Hollow Chisel Mortisers

THE Hollow Chisel type of Mortiser has been as important a factor in the advancement of production in the woodworking industry as have high speed tools in the working of metal. This type of machine was introduced by us nearly fifty years ago and the line shown throughout the following thirty-six pages is the present day development of the first mortiser which was then known as the machine that "bores square holes."

Mortising by machine is the outgrowth of mortising and tenoning by hand. It consists of cutting a square or oblong hole in wood

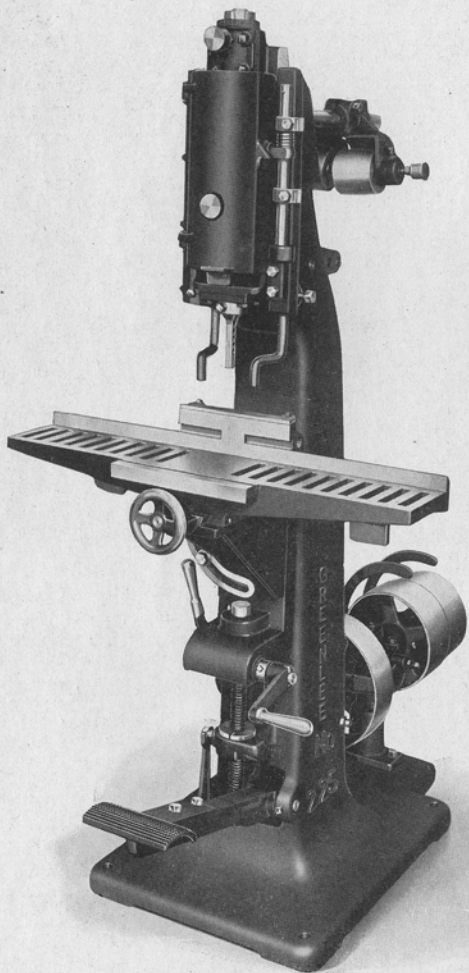


Some Examples of Mortising Work

at one or more strokes. The old style chopping mortiser requires the boring of a hole and also the cleaning out of the chips by hand after the chopping operation is performed. The Hollow Chisel Mortiser eliminates these two operations and makes a smooth clean mortise without the least jar or pound.

This mortiser uses a square chisel with a hole through it. A special form of boring bit is encased within the chisel and both are held in a fixed relation to each other. The bit cuts slightly in advance of the chisel, boring a round hole whose diameter is equal to the chisel size. The edges of the chisel cut the corners perfectly square and clean and all chips are carried away by the bit. Partial cuts may be taken on the edge of stock and oblong, oval or other shapes of chisels used for special work.

There are very few plants where wood is assembled into a finished product that do not have mortising operations to perform. The kind of work and expected production determine the most suitable size and pattern of machine. Our experience in building both machines and their tools is at your disposal.



No. 225 Foot Feed Vertical Hollow Chisel Mortiser

Also built with Compound Table the same
as that of No. 225-BM shown on Page 8



No. 225 Foot Feed Vertical Hollow Chisel Mortiser

ANY woodworking shop having a moderate amount of light mortising to do, will find this machine most useful and economical. While suitable only for small chisels, the size of mortise is limited only in depth, as any length or width is possible by successive strokes of the chisel.

The General Design is along the same lines as the No. 227 Power Feed Mortiser. The tools feed to the work with quick return, the table is supported directly under the chisel, and full provision has been made for assuming the thrust.

The Frame is a strong one piece casting with the interior cored out to provide space for the carriage lever and connections to the foot treadle. The large opening at the back allows easy access to adjust the coil spring which returns the chisel carriage.

The Chisel and Bit Carriage reciprocates in planed ways on the face of the frame. The stop rod controls its movement and regulates the depth of mortise, also providing spring cushion on the return stroke. The pulley and spindle are completely enclosed.

The Table can be either a plain or compound tilting type. The latter has a work clamp and both are arranged to receive a lay-out stop rod which will be furnished at extra cost. The compound table has rack and pinion lengthwise movement in addition to the vertical and cross adjustment of the plain table. A special high back fence with or without an attached top clamp and for stock up to 14 inches high can be furnished when required.

The Spindle is driven by a belt from the countershaft over idle pulleys with adjustment to take up the stretch. When desired, we can furnish a wire mesh guard to completely enclose this belt.

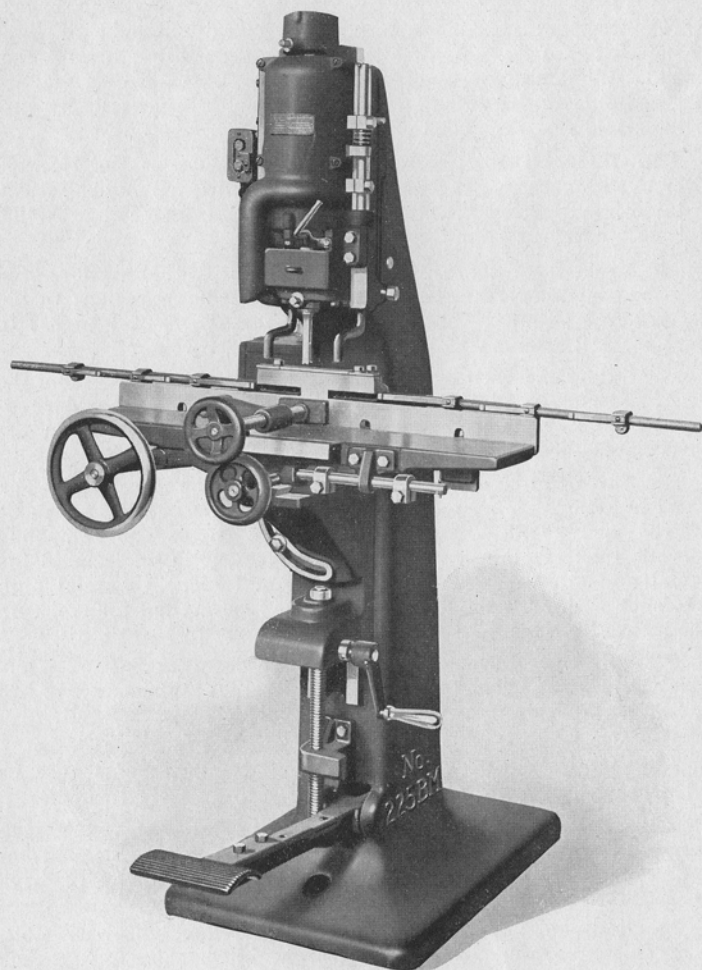
The Range is for chisels from $\frac{1}{4}$ to $\frac{5}{8}$ -inch square and a 4-inch maximum stroke. Chisels of 4 or $2\frac{3}{4}$ -inch blade may be used. The maximum distance from chuck to table is 19 inches.

When Belt Driven, the rear base countershaft has $10 \times 4\frac{1}{4}$ -inch tight and loose pulleys running 1150 R. P. M. An attached insulating bracket and special pulley may be substituted for drive by a 2 H. P., 1800 R. P. M. motor.

The Equipment includes one $\frac{3}{8} \times 4$ -inch hollow chisel with bit, set of chisel bushings, adjustable thrust bit bushings, wrenches and the specified arrangement of drive.

No.	Style of Table	Floor Space	Wt. in Lbs.	Code
225	Plain	3' x 4' 6"	1150	MEADER
225-B	Compound	3' x 4' 6"	1200	MEADOUT

Belt Guard of wire mesh, extra



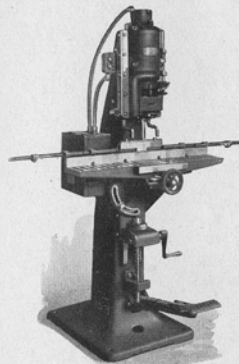
No. 225-BM Motor Driven Foot Feed Mortiser



No. 225-BM Motor Driven Foot Feed Mortiser

WITH the exception of the method of drive, this foot feed mortiser is designed along the same general lines as our No. 225 belted machine shown on page 6. All belts, however, are eliminated by the use of a built-in motor on the bit spindle, and a built-in blower is also provided for motor ventilation, chip removal and cooling the mortising tools.

Its Application is most general in shops having only a moderate amount of light mortising to perform. Manual training and trade schools also find it admirably adapted to their needs, since it has sufficient range for all projects, is safe and easy to operate and represents the best in modern woodworking machine construction.



No. 225-M Mortiser with Plain Table

The Table can be either a compound or plain type. The former has lengthwise movement for making mortises that require more than one chisel stroke, and is fitted with a work clamp. Both tables have cross adjustment for centering 6-inch stock, vertical adjustment of 11½ inches and tilting adjustment up to 45 degrees. A special high back fence with or without an attached top clamp and for stock up to 14 inches high can be furnished when required.

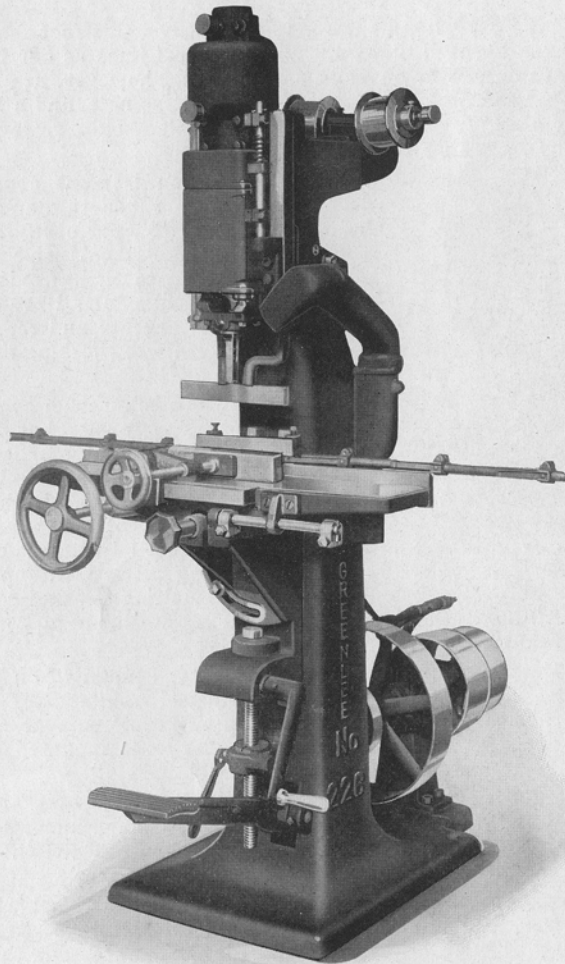
The Motor is a built-in, ball bearing type mounted on the bit spindle and is fully enclosed within the chisel carriage. It is regularly furnished for 220 or 440 volt alternating current and its speed is 3600 R. P. M. An enclosed starter is mounted on the machine frame and the wiring is in flexible conduit.

The Capacity is for chisels from ¼ to ¾-inch square, although ½-inch chisels are as large as can be efficiently used under average conditions. The maximum chisel stroke is 4 inches and the maximum distance from table to chisel holder is 19 inches.

The Equipment includes one ¾ x 4-inch hollow chisel with bit, set of chisel bushings, adjustable thrust bit bushings, wrenches, the complete electrical equipment and a brake for stopping the spindle when the motor is shut off.

No.	Style of Table	Floor Space	Wt. in Lbs.	Code
225-BM	Compound	3' x 3'9"	1150	MECCA
225-M	Plain	3' x 3'9"	1100	MEATUS

Table Stop Rod with six stops, extra.



No. 226 Foot Feed Vertical Hollow Chisel Mortiser



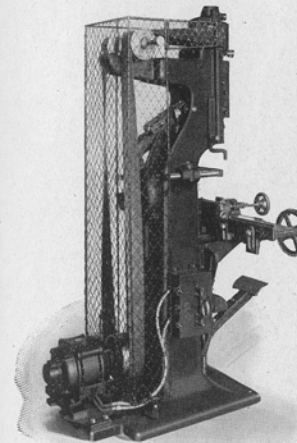
No. 226 Foot Feed Vertical Hollow Chisel Mortiser

THIS Foot Feed Mortiser is similar to our No. 225 belted spindle machine, but it also has a built-in fan blower. It is popular in shops doing a limited amount of mortising on sash, cabinet or other miscellaneous work, and is an ideal type for manual training purposes due to its safety features and ease of operation.

The Table is of the compound type with tilting adjustment to 45 degrees either way. It is 36 inches long, has 8-inch lengthwise movement, cross adjustment for centering 6-inch wide stock, and vertical adjustment of 10 inches. A work clamp is provided and the adjustable back fence is fitted with a lay-out stop rod.

The Built-in Fan Blower is important since it keeps the surface of the work free from chips and serves to cool the mortising tools. It is also a safety feature since it eliminates the necessity of brushing away the chips by hand.

The Range is for chisels from $\frac{1}{4}$ to $\frac{3}{4}$ -inch square, although $\frac{5}{8}$ -inch chisels are as large as can be efficiently used on average work. The maximum chisel stroke is 4 inches and 12-inch high stock can be handled.



No. 226 with Belt Guard and Motor

The Countershaft is mounted on the machine base and has 10x4 $\frac{1}{4}$ -inch tight and loose pulleys to run 850 R. P. M.

When Motor Driven, the countershaft is omitted and an attached insulating bracket and special pulley substituted. A 2-H.P. motor of any speed up to 1800 R. P. M. is suitable.

The Equipment regularly includes one each $\frac{3}{8}$ and $\frac{1}{2}$ -inch square chisels with bits, chisel bushings, adjustable thrust bit bushings, wrenches, the countershaft, belt shifter, and a 6-foot lay-out rod with six adjustable stops.

No.	Style of Table	Floor Space	Wt. in Lbs.	Code
226	Compound	3' 6" x 4' 6"	1350	MELLOWING
Belt Guard of wire mesh, extra				



No. 227-B Power Feed Vertical Hollow Chisel Mortiser

THIS Mortiser fully meets the demand for a power feed machine suitable for sash, cabinet, and other light manufacturing work. It is complete in all the features necessary for the successful operation of hollow chisels under widely varying conditions.

The **Frame** is a one piece casting fully enclosing the power feed mechanism with the exception of the drive pulley. The built-in fan blower is an important feature since the air blast serves to cool the tools and, by keeping the surface of the work free from chips, eliminates the need of brushing them away by hand.

The **Power Feed** has three speeds, regularly providing 18, 26 and 36 strokes per minute by means of cone pulleys which, however, can be proportioned to give much faster feeds where the conditions of work make this desirable. A convenient foot lever controls the feed movement, and when released, the chisel carriage stops.

The **No. 227-B Machine** has a Compound Table fitted with a screw clamp and has rack and pinion lengthwise travel gauged by adjustable stops. This table arrangement is generally recommended. The No. 227 type has a Plain Table without these features and is furnished only when the work does not require clamping.

Both **Tables** are 6½x36-inch size, have vertical and angular adjustment and transverse movement to center 6-inch stock. A 6-foot long stop rod with lay-out stops is fitted to the adjustable back fence which has a lip hold-down. Two additional stock hold-downs are also carried from the frame. A special high back fence with or without an attached top clamp and for stock up to 14 inches high can be furnished when required.

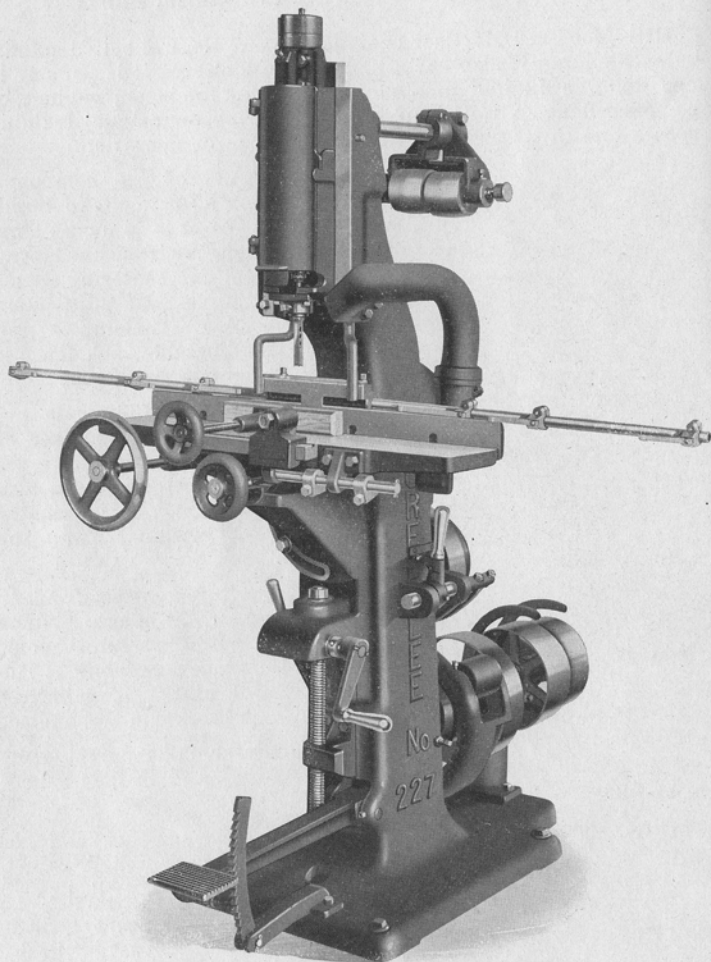
The **Range** is for chisels from ¼ to ¾-inch square, and a 4-inch maximum stroke. Chisels of 4 or 2¾-inch blade length may be used. The maximum distance from chuck to table is 19 inches and the table adjustment is 10 inches.

The **Countershaft** has 10x4¼-inch tight and loose pulleys to run 1150 R. P. M., or a 3 H. P. motor carried on an attached bracket may be coupled to this shaft to drive the complete machine.

The **Equipment** includes one ½x4-inch hollow chisel with bit, chisel bushings, adjustable thrust bit bushings, stops, wrenches and the arrangement of drive specified.

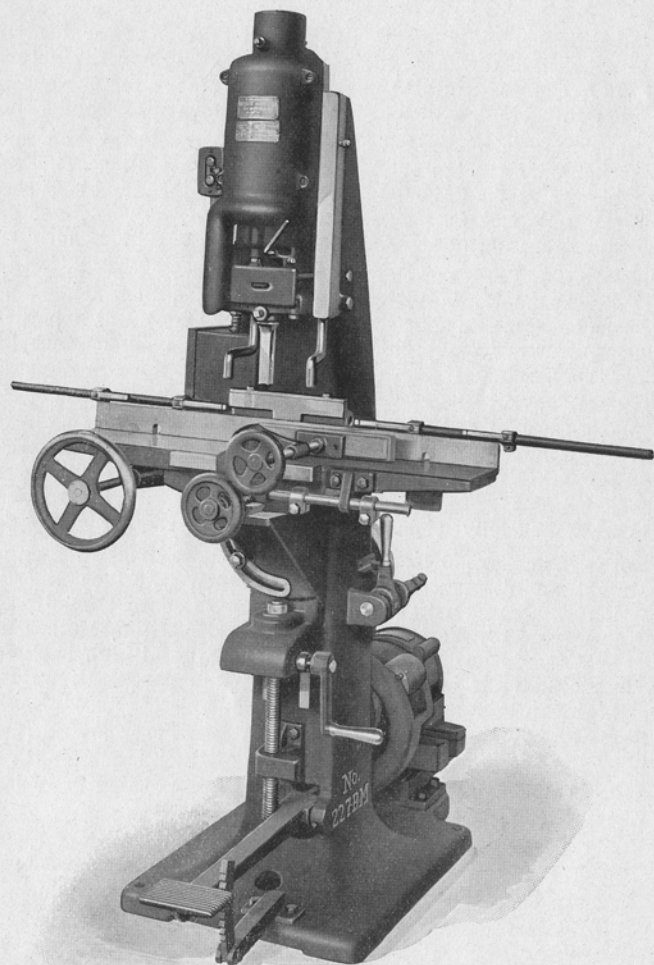
No.	Style of Table	Floor Space	Wt. in Lbs.	Code
227-B	Compound	3'8" x 5'6"	1350	MELTON
227	Plain	3'8" x 5'6"	1300	MELTING

Belt Guard of wire mesh, extra



No. 227-B Power Feed Vertical Hollow Chisel Mortiser

Also built with a Plain Table similar to that of No. 225 shown on Page 6.



No. 227-BM Motor Driven Vertical Power Feed Mortiser



No. 227-BM Power Feed Mortiser with Built-in Motor

THE outstanding feature in the design of this light power feed mortiser is the use of a built-in motor for the drive of the bit spindle, which eliminates the usual long belt running over idlers and materially lowers the power consumption. In other respects it is of the same general design as our No. 227-B belted machine.

The **Built-in Motor** is mounted on the bit spindle and runs 3600 R. P. M. It is regularly furnished for either 220 or 440 volt alternating current. A separate motor for the feed mechanism is mounted on an attached base bracket. Both are wired in flexible conduit and have an enclosed starter on the machine frame.

The **Chisel Carriage** is extra long and reciprocates in gibbed ways. It fully encloses the bit spindle which runs in ball bearings and has a hand brake for stopping. A built-in blower ventilates the motor and keeps the work free from chips.

The **Power Feed** has three speeds, regularly providing 18, 26 and 36 strokes per minute by means of cone pulleys which, however, can be proportioned to give much faster feeds where the conditions of work make this desirable. A convenient foot lever controls the feed movement, and when released, the chisel carriage stops.

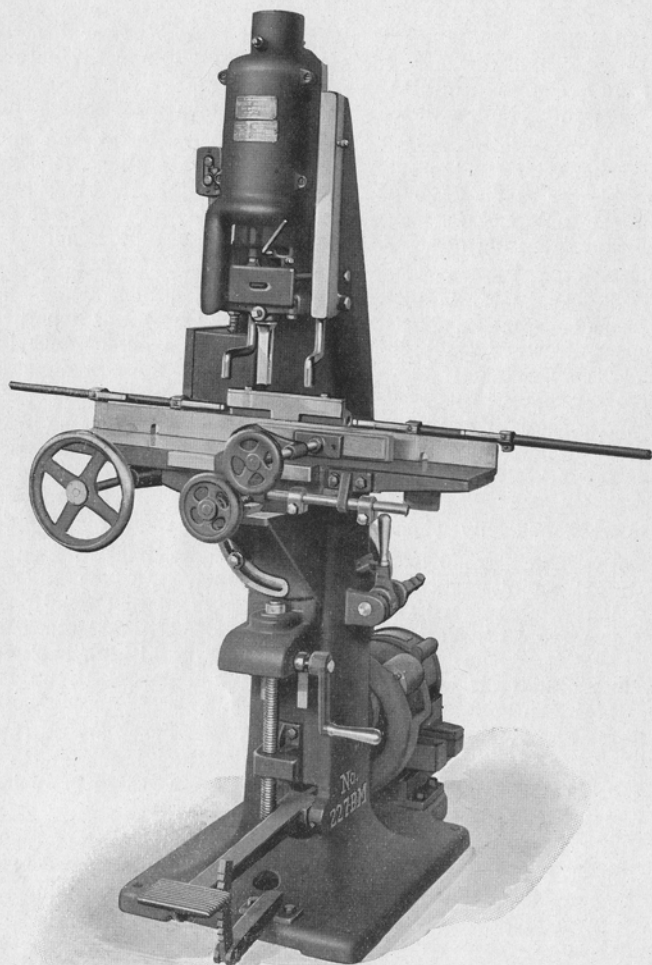
The **No. 227-BM Machine** has a Compound Table fitted with a screw clamp and has rack and pinion lengthwise travel gauged by adjustable stops. This table arrangement is generally recommended. The No. 227-M type has a Plain Table without these features and is furnished only when clamping is required.

Both **Tables** are 6½x36-inch size, have vertical and angular adjustment and transverse movement to center 6-inch stock. A 6-foot long stop rod with lay-out stops is fitted to the adjustable back fence which has a lip hold-down. A special high back fence, with or without an attached top clamp and for stock up to 14 inches high can be furnished.

The **Range** is for chisels from ¼ to 1-inch square, and a 4-inch maximum stroke. Chisels of 4 or 2¾-inch blade may be used. Stock up to 14-inches high can be worked under a 4-inch chisel and the table adjustment is 10-inches.

The **Equipment** includes one ½x4-inch hollow chisel with bit, chisel bushings, adjustable thrust bit bushings, stops, wrenches and the complete electrical equipment.

No.	Style of Table	Floor Space	Wt. in Lbs.	Code
227-BM	Compound	3' x 4'4"	1450	MEDLAR
227-M	Plain	3' x 4'4"	1400	MEDIA



No. 227-BM Motor Driven Vertical Power Feed Mortiser



No. 227-BM Power Feed Mortiser with Built-in Motor

THE outstanding feature in the design of this light power feed mortiser is the use of a built-in motor for the drive of the bit spindle, which eliminates the usual long belt running over idlers and materially lowers the power consumption. In other respects it is of the same general design as our No. 227-B belted machine.

The **Built-in Motor** is mounted on the bit spindle and runs 3600 R. P. M. It is regularly furnished for either 220 or 440 volt alternating current. A separate motor for the feed mechanism is mounted on an attached base bracket. Both are wired in flexible conduit and have an enclosed starter on the machine frame.

The **Chisel Carriage** is extra long and reciprocates in gibbed ways. It fully encloses the bit spindle which runs in ball bearings and has a hand brake for stopping. A built-in blower ventilates the motor and keeps the work free from chips.

The **Power Feed** has three speeds, regularly providing 18, 26 and 36 strokes per minute by means of cone pulleys which, however, can be proportioned to give much faster feeds where the conditions of work make this desirable. A convenient foot lever controls the feed movement, and when released, the chisel carriage stops.

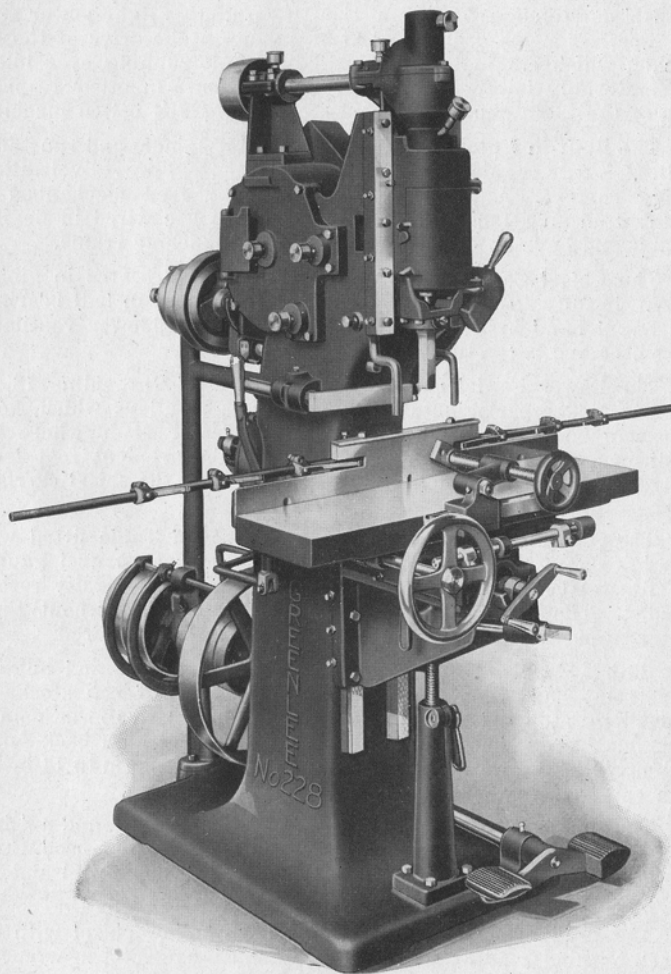
The **No. 227-BM Machine** has a Compound Table fitted with a screw clamp and has rack and pinion lengthwise travel gauged by adjustable stops. This table arrangement is generally recommended. The No. 227-M type has a Plain Table without these features and is furnished only when clamping is required.

Both **Tables** are 6½x36-inch size, have vertical and angular adjustment and transverse movement to center 6-inch stock. A 6-foot long stop rod with lay-out stops is fitted to the adjustable back fence which has a lip hold-down. A special high back fence, with or without an attached top clamp and for stock up to 14 inches high can be furnished.

The **Range** is for chisels from ¼ to 1-inch square, and a 4-inch maximum stroke. Chisels of 4 or 2¾-inch blade may be used. Stock up to 14-inches high can be worked under a 4-inch chisel and the table adjustment is 10-inches.

The **Equipment** includes one ½x4-inch hollow chisel with bit, chisel bushings, adjustable thrust bit bushings, stops, wrenches and the complete electrical equipment.

No.	Style of Table	Floor Space	Wt. in Lbs.	Code
227-BM	Compound	3' x 4'4"	1450	MEDLAR
227-M	Plain	3' x 4'4"	1400	MEDIA



No. 228 Power Feed Vertical Hollow Chisel Mortiser



No. 228 Power Feed Vertical Hollow Chisel Mortiser

THE application of this mortiser is exceptionally broad, due to its wide range of adjustments, perfect feed control and convenient operating features. It has an enviable record in the automobile body industry and is used extensively in the manufacture of sash and doors, carriages, implements and furniture.

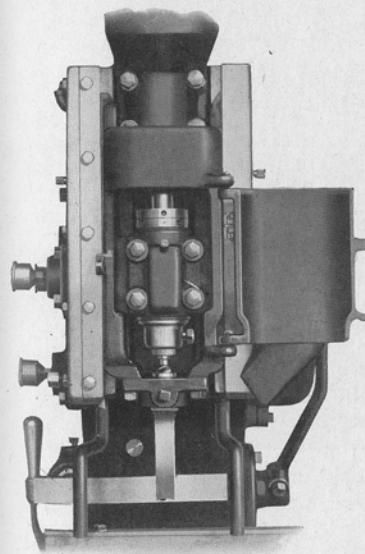
The General Design embodies a stocky one piece frame which entirely encloses the feeding mechanism and provides a built-in fan blower for chip removal and cooling the tools. The main belt drives the shaft at the top of the machine and power is transmitted to the bit spindle through heat treated bevel gears running in oil. The feed belt is on four-step cone pulleys.

The Feed is by a geared pitman of great power, yet perfectly controlled by either the hand lever or the double foot treadle which operate an expansion clutch within the feed cone.

The Chisel Carriage is extra long and reciprocates in gibbed ways. Its stroke is adjustable from $2\frac{1}{2}$ to 5 inches with four rates

of feed varying from 16 to 40 strokes per minute with quick return. Adjustable thrust bit bushings aid in proper tool setting and minimize tool breakage. The revolving parts are guarded by a hinged cover which permits easy access to the spindle for setting the bit in correct relation to the chisel.

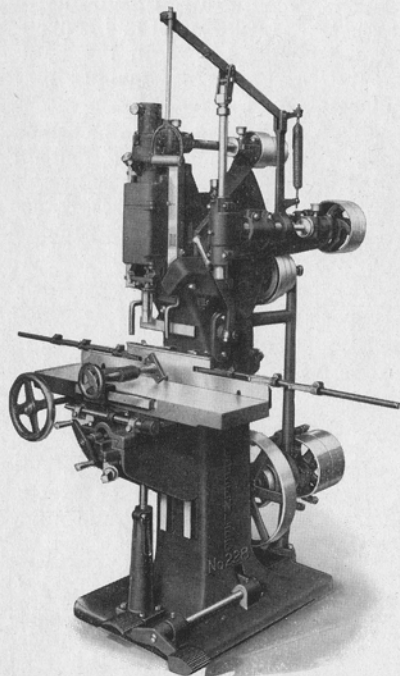
The Compound Table has vertical adjustment of 12 inches, lengthwise movement of 12 inches by rack and pinion, and cross adjustment of 5 inches by a quick acting screw. Lay-out stops are provided to gauge its movement for duplicate work. When clamped in position, the work is not moved until the mortise is completed as the compound adjustments permit bringing it to the correct position under the chisel.



No. 228 Chisel Carriage



No. 228 Mortiser—Continued



No. 228 with Boring Attachment

The boring attachment is usually applied for handling the ordinary boring work which is often required on stock being mortised.

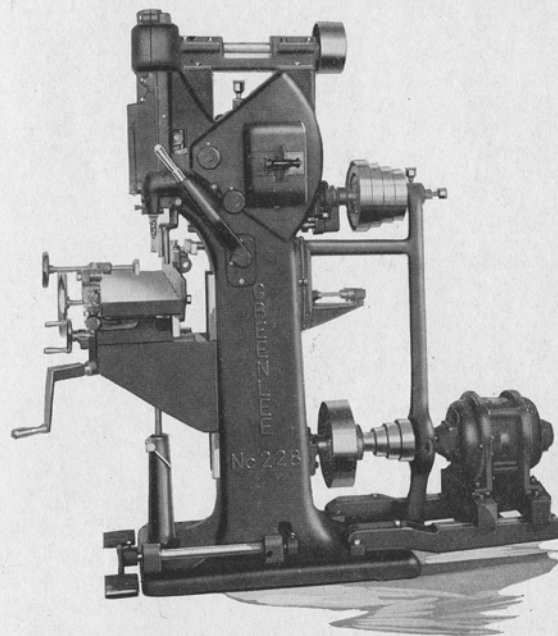
The Range is for chisels from $\frac{1}{4}$ to $1\frac{1}{4}$ -inch square and 5-inch maximum stroke. The compound table will take 15-inch high and the other pattern 12-inch high material, while both adjust to center 8-inch stock under the chisel.

The Countershaft is securely mounted on the base of the frame so that the machine is entirely self contained. It is fitted with $10 \times 4\frac{1}{4}$ -inch tight and loose pulleys to run 850 R. P. M.

The Universal Table has tilting adjustment to 30 degrees in addition to the adjustments and equipment of the compound type. It is intended for use in shops where the product regularly requires the making of mortises on an angle.

Both Tables are $9\frac{1}{2} \times 36$ -inch size. The back fence is adjustable for height, is fitted with a lip hold-down and carries the 6-foot stop rod with its adjustable lay-out stops. An auxiliary back fence, carried from the frame, is provided for extremely high work. The table extension at the front is fitted with a screw clamp for holding the work and adjustable prong hold-downs are also carried from the machine frame.

A Boring Attachment with angular adjustment to 35 degrees in either direction

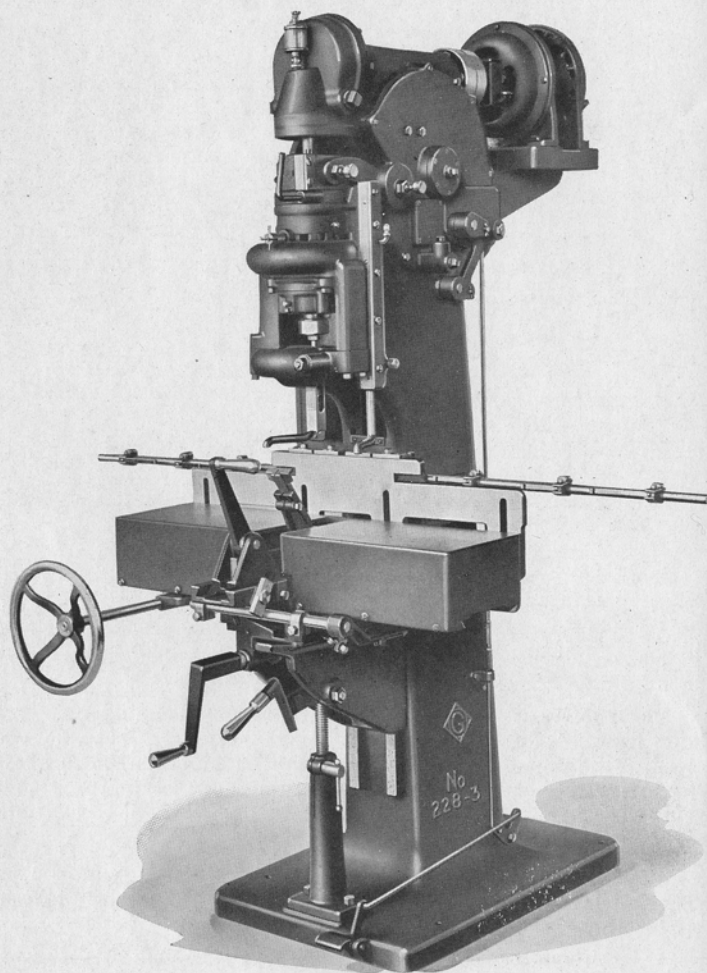


No. 228 with Attached Motor Bracket

Motor Drive is regularly by a 5 H. P. motor running 1200 R. P. M. or less, mounted on an attached insulating bracket and connected to the base drive shaft by a sleeve coupling as shown above. This provides a compact and self-contained unit with three short open belts for driving the horizontal shaft at the top, the variable feed, and the fan blower.

The Equipment includes one each $\frac{5}{16} \times 2\frac{3}{4}$ -inch, $\frac{3}{8}$ and $\frac{1}{2} \times 4$ -inch, $\frac{5}{8}$ and $\frac{3}{4} \times 5$ -inch hollow chisels and bits, chisel bushings, adjustable thrust bit bushings and set of wrenches.

No.	Style of Table	Floor Space	Wt. in Lbs.	Code
228	Compound	4' x 6'	2200	MELODION
228-C	Universal	4' x 6'	2225	MELODIST
	Boring Attachment, extra		175	ODAD
	Motor bracket and sleeve connection, extra			
	Belt Guard of wire mesh, extra			



No. 228-3 Power Feed Vertical Hollow Chisel Mortiser

Also furnished with Tight and Loose Pulleys.
Either arrangement substituted for the other
at any time.



No. 228-3 Power Feed Vertical Hollow Chisel Mortiser

SIMPLICITY of operating parts combined with a correct ratio between the spindle speed and the chisel feed makes possible the exceptionally high productive capacity of the mortiser illustrated on the opposite page. It represents the latest development in the design of a medium range machine for operating chisels up to $1\frac{1}{4}$ inches square, which is sufficient for general manufacturing work, including the production of automobile bodies.

The Operation of this mortiser resembles that of a punch press, to the extent that the chisel carriage makes a quick stroke and stops when the foot treadle is pressed down. If the treadle is held down, the carriage makes continuous strokes at the rate of fifty per minute. A blower keeps the work free from chips, and a connection for an exhaust pipe is provided.

The Feeding Mechanism is fully enclosed within the frame and is driven from the horizontal shaft, which also drives the bit spindle. Only two gears are used, a worm and a large worm gear. The latter drives the cam which operates the chisel carriage, providing a uniform feeding stroke and a quick return.

The Bit Spindle is driven through a pair of spiral bevel gears and a splined shaft. The latter connects with the bit spindle through a broached sleeve, permitting the chisel carriage to feed up and down. A self-centering bit chuck and a hinged chisel holder provide quick action for changing tools.

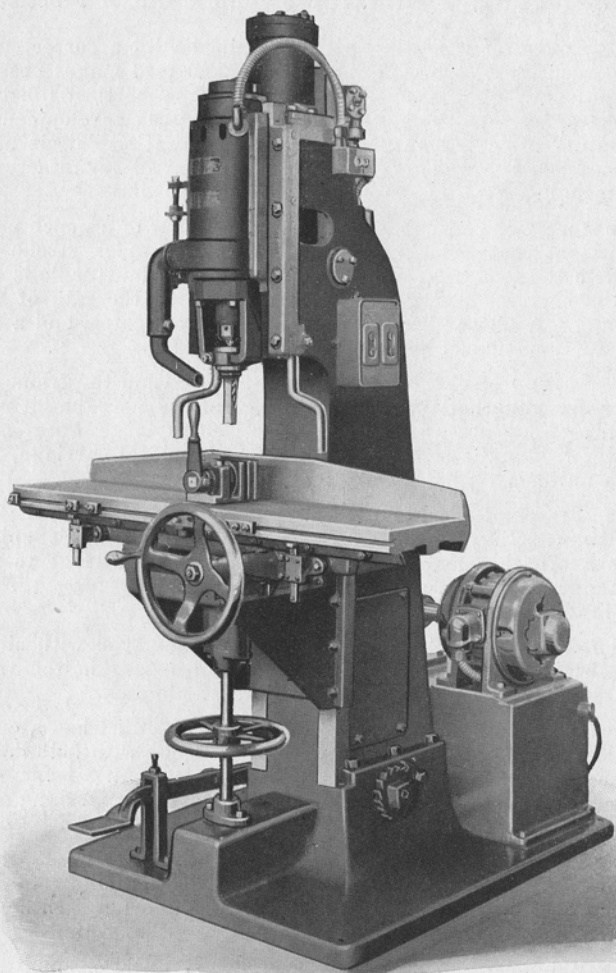
All Bearings are either of the ball or roller type with simple and efficient lubrication. Only four gears are used in the whole machine, and internal belting is entirely eliminated.

The Table is 40 inches long, $10\frac{3}{4}$ inches wide and has a quick-acting lever clamp, also an adjustable back fence with hold-downs. It has rack and pinion lengthwise travel, quick-acting lever cross adjustment and geared screw vertical adjustment for working stock up to 10 inches high.

The Drive can be from a standard 5 H. P., 1800 R. P. M. motor as shown, or tight and ball-bearing loose pulleys for belt drive can be furnished in place of the motor bracket. Either arrangement can be substituted for the other at any time.

The Equipment includes one each $\frac{5}{16} \times 2\frac{3}{4}$ -inch, $\frac{3}{8}$ and $\frac{1}{2} \times 4$ -inch, $\frac{5}{8}$ and $\frac{3}{4} \times 5$ -inch hollow chisels and bits, chisel and bit bushings, the lay-out stop rod and necessary wrenches.

No.	Drive Arrangement	Floor Space	Code
228-3	Motor Bracket	4'6" x 4'8"	MEDULLA
228-3	Tight and Loose Pulleys	4'6" x 4'8"	MEDUSA



No. 229 Motor Driven Vertical Hollow Chisel Mortiser
With Hydraulic Power Feed



No. 229 Motor Driven Vertical Hollow Chisel Mortiser
With Hydraulic Power Feed

THE Mortiser illustrated on the opposite page was developed by Baxter D. Whitney and Son, and is now included in the Greenlee line as a result of the transfer to this company of the design and patent rights. The addition of a medium heavy machine of this type offers a wider selection to users of Hollow Chisel Mortisers and increases the extent of a line of machinery which is, beyond question, the most complete and highly developed of any on the market.

The Application of this mortiser is quite general, although, because of its chisel capacity and range, it is especially suited to the manufacture of automobile bodies, implements and other relatively heavy work. It is built on a rigidly constructed frame, has convenient adjustments and is provided with ample power for all work within its range.

Built-in Motor Drive for the ball-bearing bit spindle eliminates all belts and makes for low power consumption. The motor is enclosed within the chisel carriage, but is fitted with a fan for forced ventilation, which also provides an air blast for chip removal and cooling the mortising tools. The built-in motor is regularly furnished for 220 or 440 volt alternating current and its speed is 3600 R. P. M.

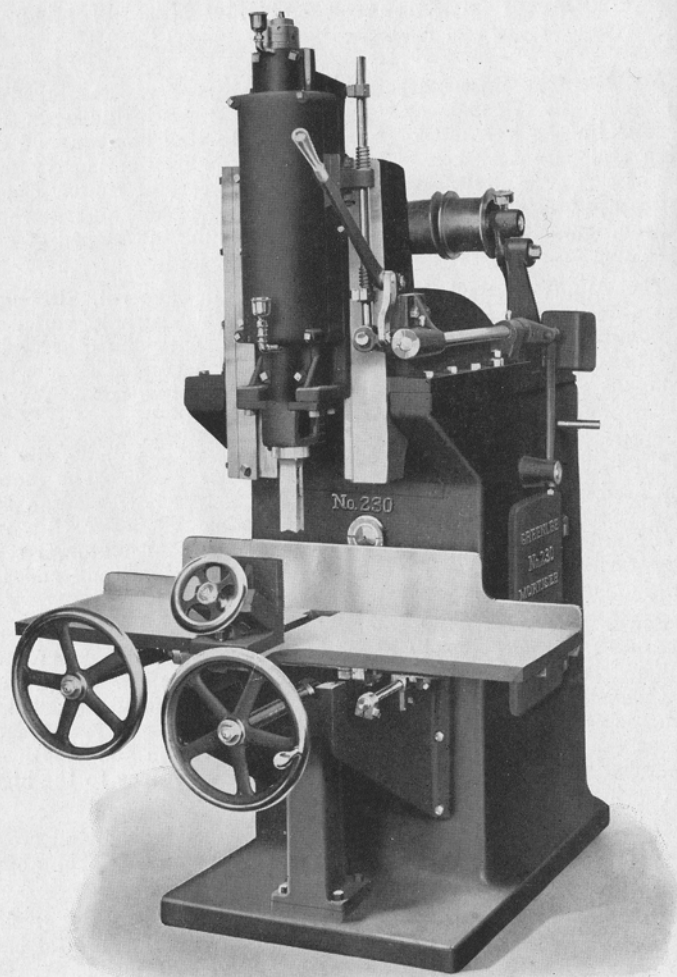
Power Feed for the chisel carriage is provided by means of a hydraulic cylinder and piston to which oil under pressure is supplied by a motor driven pump. Three feeding speeds are had and the return stroke is twice as fast as the mortising stroke. When the foot lever is pressed down the carriage will reciprocate between the two stops which determine the position and length of the stroke, but when it is released the carriage returns to the high position to provide clearance for replacing work.

The Table is of the compound type having vertical and cross adjustments, also lengthwise movement gauged by adjustable stops. It is fitted with a quick acting work clamp.

The Range is for chisels up to 1½ inches square and the stroke is adjustable up to 6 inches in length. 12-inch high material can be worked and the table will clamp widths up to 12 inches.

The Equipment includes the motors with push button control, chisel and bit bushings, wrenches and one each 5/16 x 2¾-inch, ¾ and ½ x 4-inch, 5/8 and ¾ x 5-inch hollow chisels and bits.

No.	Floor Space	Wt. in Lbs.	Code
229	4'0" x 5'6"	3150	MELINITE



No. 230 Vertical Hollow Chisel Mortiser

Also built with one or two Universal
Boring Attachments.



No. 230 Vertical Hollow Chisel Mortiser

THIS Mortiser fully meets the demand for a medium heavy vertical machine for use in furniture, wagon, implement, and automobile body factories as well as in the smaller car shops. The design is similar in general details to that of our large vertical car mortisers.

The Chisel Ram reciprocates under control of automatic stops and can also be started, stopped, or reversed at any point in its stroke by means of the hand lever. It carries the bit spindle in long self-oiling bearings provided with ball thrust bearings.

The Feed Mechanism is driven from the countershaft by a two step cone pulley. Internal expansion clutches, driven through a simple chain of spur gears, actuates the feed and reverse. This mechanism is fully enclosed but easily accessible.

The Table has cross adjustment and lengthwise movement gauged by lay-out stops. It is at a fixed height since adjustments can be made by changing the length and location of the chisel stroke. The travel of the ram permits making a short stroke either at the table level or at the top of a 12-inch timber.

Universal Boring Attachments may be added to this mortiser when desired. They have quick adjustment, wide range, and capacity for bits up to 2½-inch diameter.

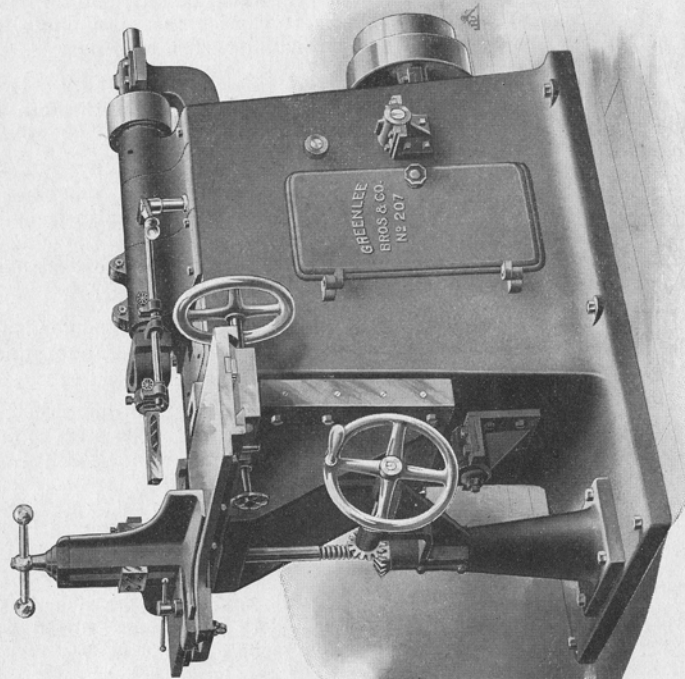
The Range is for chisels up to 1½-inch square, although 1¾-inch chisels can be used under some conditions. The maximum stroke is 13 inches. Timbers 12 inches high can be mortised and the standard table will clamp 14-inch widths.

The Countershaft is regularly overhead and has 12x5½-inch tight and loose pulleys to run 725 R. P. M. Base drive can be arranged when desired.

When Motor Driven, the motor may couple to the overhead countershaft, or it can be direct connected to an attached auxiliary base shaft provided to obtain the two speeds of feed. A 7½-H. P. motor of any speed from 700 to 900 R. P. M. is suitable.

The Equipment includes one each ½, 5⁄8, ¾, 1 and 1¼ by 6½-inch blade hollow chisels with bits, set of tool holders, stops and wrenches. With boring attachments a set of machine bits in five sizes from ½ to 1-inch is added, also safety bit guards.

No.	Style	Floor Space	Wt. in Lbs.	Code
230	No Bor. Attachments	5' 8" x 4'	4300	MEMBRAL
230-B	1 Bor. Attachment	5' 8" x 4' 5"	4900	MEMORIA
230-C	2 Bor. Attachments	5' 8" x 4' 10"	5500	MEMPHITE



No. 207 Horizontal Hollow Chisel Mortiser



No. 207 Horizontal Hollow Chisel Mortiser

FOR certain classes of medium heavy mortising, some manufacturers have standardized on horizontal machines, and in such cases we offer our No. 207, which is an improved pattern of our former No. 5 Mortiser. Its application is very general and many have been installed for use in the manufacture of wagons, implements, furniture, automobile bodies, etc.

The Design embodies a box form of main frame, fully enclosing the power feed mechanism and providing rigid support for the table and reciprocating chisel carriage. A door on either side of the frame permits easy access to the frictions.

Standard Tables are furnished in two styles. The No. 207-C has an extra wide table fitted with a swivel fence adjusting to 16 inches from the front edge. The No. 207 table has a straight fence adjusting to 10 inches from the front. Material $9\frac{1}{2}$ inches in thickness can be handled under the quick acting screw clamp.

The Power Feed Mechanism is driven by a cone pulley which provides a change of feeding speed. Slow-running external band frictions operating through chain connected drums to a rack and pinion, produce the reciprocating motion.

The Control is simple and convenient. The carriage reciprocates with quick return, under control of automatic stops, but can be reversed, stopped or started from any point in its stroke by means of the operating lever. The length and position of the stroke is regulated by the adjustable stops.

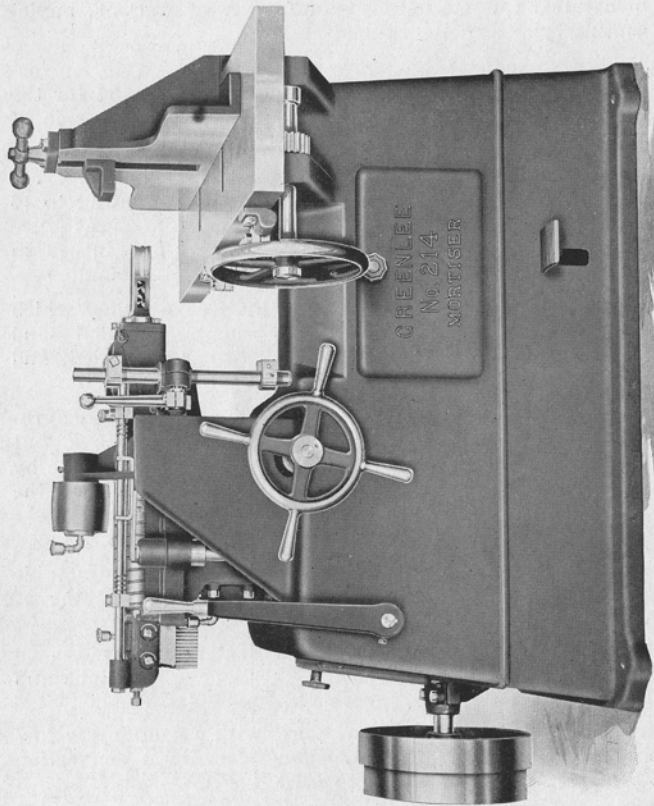
The Range is for $\frac{5}{16}$ to $1\frac{1}{4}$ inch chisels, although larger sizes can be used under favorable conditions. The stroke is adjustable up to 6 inches, which permits mortising to maximum depths of 5 to $5\frac{1}{2}$ inches with $6\frac{1}{2}$ inch blade chisels.

When Belt Driven, a countershaft is furnished for overhead location or for mounting on or beneath the floor. The tight and loose pulleys are $10 \times 5\frac{1}{2}$ inches and should run 850 R. P. M.

When Motor Driven, a short floor shaft with a coupling is furnished in place of the regular countershaft for direct connection to a 5 H. P. motor of any speed up to 1200 R. P. M.

The Equipment includes one each $\frac{3}{8} \times 4$ inch and $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$ and $1 \times 6\frac{1}{2}$ inch blade hollow chisels and bits, bushings, wrenches and the proper shaft for either method of drive.

No.	Floor Space	Wt. in Lbs.	Code
207	5' x 3'6"	2300	MAJESTIC
207-C	5' x 3'6"	2375	MAJOON



No. 214 Horizontal Hollow Chisel Mortiser



No. 214 Horizontal Hollow Chisel Mortiser

THIS Horizontal Mortiser is often preferred to the vertical type for the medium heavy work in furniture, wagon, implement and automobile body factories, as well as in the smaller car shops. It has the same range as our No. 230 vertical machine and is particularly convenient because of the easy vertical adjustment of the chisel ram and because the chips fall from the face of the stock leaving lay-out lines clearly visible.

The **Frame** is a heavy box form which entirely encloses the feeding mechanism. At the rear are gibbed ways upon which the timber table is mounted and adjusted. At the front are ways to carry the vertically adjustable knee piece supporting the reciprocating chisel ram. This is counterbalanced and fitted with a quick adjusting and locking device.

The **Timber Table** has 14-inch longitudinal movement and is provided with a powerful screw clamp. The heavy back fence has angle adjustment as well as cross adjustment for varying widths of stock. A multiple lay-out stop rod on the edge of the table is controlled by a foot treadle for gauging the length of mortises.

The **Feed Mechanism** is driven by a cone pulley which provides two speeds of feed. Internal band frictions on a shaft properly geared to the chisel ram produce the reciprocating motion. The frictions are engaged and released by an automatic stop rod on the ram for continuous strokes. A lever is provided, however, for starting, stopping or reversing the ram from any position.

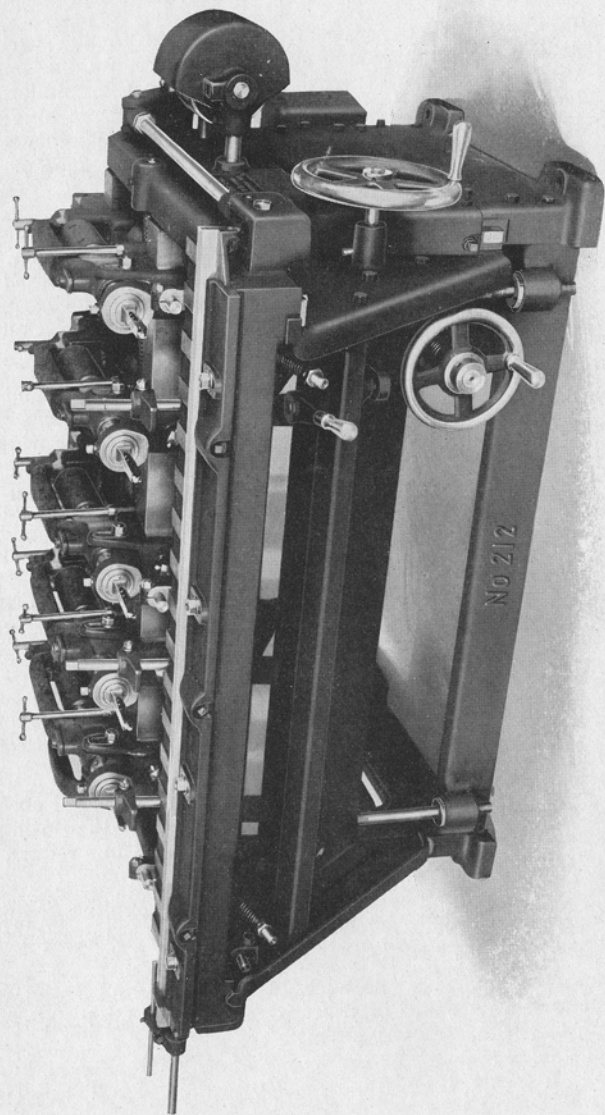
The **Range** is for chisels from $\frac{5}{16}$ to $1\frac{1}{2}$ -inch regularly, or $1\frac{3}{4}$ -inch in special cases. The chisel ram has an 8-inch stroke and 8-inch vertical adjustment. The table will clamp stock up to 10 inches high and 8-inch or greater width.

The **Countershaft** is regularly overhead, but when placed on or beneath the floor, special idlers are added. It has $10 \times 5\frac{1}{2}$ -inch tight and loose pulleys to run 725 R. P. M. The belting required is an endless spindle belt and one for the feed cones.

When **Motor Driven**, a short floor shaft with a coupling is furnished in place of the regular countershaft for direct connection to a $7\frac{1}{2}$ H. P. motor of any speed from 700 to 1200 R. P. M.

The **Equipment** includes one each $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, 1 and $1\frac{1}{4} \times 6\frac{1}{2}$ -inch blade hollow chisels and bits, set of chisel and bit bushings, wrenches, and the separate countershaft.

No.	Floor Space	Wt. in Lbs.	Code
214	6' 3" x 4' 6"	3600	MAJORCAN



No. 212 Multiple Spindle Hollow Chisel Mortiser

Built with from 3 to 6 spindles.



No. 212 Multiple Spindle Hollow Chisel Mortiser

THIS Multiple Mortiser is an economical machine for any work requiring several mortises within a reasonable distance in the same piece of stock. It has been furnished extensively for various classes of work including the manufacture of sash, doors, furniture, implements, factory trucks, etc.

The Spindles are moved lengthwise by rack and pinion and have vertical adjustment of $1\frac{1}{2}$ inches for staggered mortises. All have endwise adjustment of 2 inches for equalizing chisel lengths, making mortises of different depths, or setting for angle work.

The Plain Table is 5 feet long and 18 inches wide. It is fitted with front stripping stops, an end stop for locating the work, and an adjustable back fence which is regularly 2 inches high.

An Automatic Power Clamp is shown in the cut of this machine and is furnished as an extra. It is suitable only for the plain table and operates to grip the work during the mortising stroke and until the chisels are withdrawn.

A Compound Table having 6-inch lengthwise movement can be furnished for making long mortises. A hand lever clamp is then provided for holding the stock in position.

The Feed is continuous but is absolutely under the control of the hand lever for instantly stopping or starting. The feeding speeds can be furnished to suit the work, and feeds of from 7 to 28 strokes per minute are possible. The stroke is adjustable for 4, 5 or 6-inch lengths.

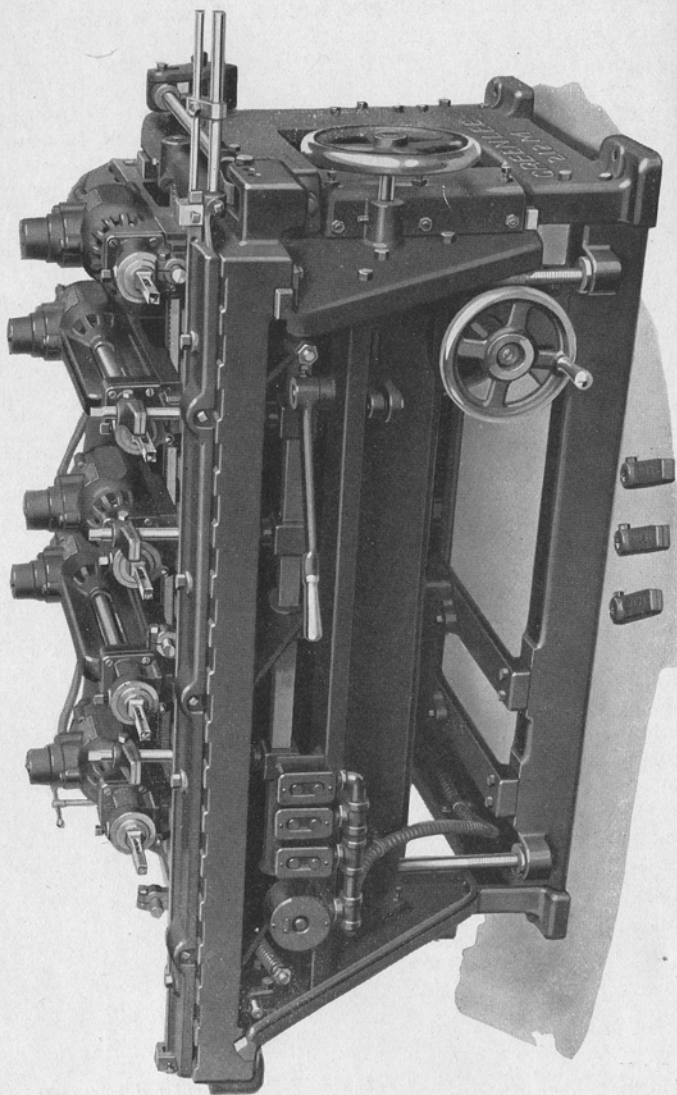
The Range is regularly for mortises from 4 to 50-inch centers and for chisels up to 1-inch square. On special order a frame for 72-inch maximum centers can be furnished.

The Countershaft has 12x6 $\frac{1}{2}$ -inch tight and loose pulleys to run 750 R. P. M. When motor driven, a coupling is furnished in place of the pulleys. Motor varies from 10 to 15 H. P. according to work and number of spindles. The speed should be 900 R.P.M. or less.

The Equipment includes one chisel and bit for each spindle, set of chisel and bit bushings, and the attached countershaft.

No.	No. of Spindles	Floor Space	Wt. in Lbs.	Code
212	3	6' x 6' 9"	4250	MAILBAG
212	4	6' x 6' 9"	4350	MAILCAR
212	5	6' x 6' 9"	4450	MAILMAN
212	6	6' x 6' 9"	4550	MAILSAC

Our No. 212-M Mortiser is shown on page 32. It is of similar design to the above but has a built-in motor for each head to eliminate the spindle belt.



No. 212-M Motor Driven Multiple Spindle Mortiser



No. 212-M Motor Driven Multiple Spindle Mortiser

THE design of this Power Feed Multiple Mortiser closely follows that of our belt driven No. 212, except for the method of drive. Each mortising head has a built-in motor mounted on the bit spindle, which runs in ball bearings. The long spindle belt is thus eliminated and the power consumption reduced to a minimum.

The **Built-in Motors** are regularly furnished for 220 or 440 volt alternating current and run 3600 R. P. M. Push button start and stop stations provide convenient control for each group of three or less, and a snap switch is furnished for each motor so that any head can be cut out when not required.

The **Mortising Heads** are moved lengthwise of the machine by rack and pinion and have vertical adjustment of 1 inch for staggered mortises. All have endwise adjustment of 1½ inches for equalizing chisel lengths or for making mortises of different depths.

The **Plain Table** is 5 feet long and 13 inches wide. It is fitted with front stripping stops, an end stop for locating the work, and an adjustable back fence which is regularly 2 inches high.

An **Automatic Power Clamp** is shown in the cut of this machine and is furnished as an extra. It is suitable only for the plain table and operates to grip the work during the mortising stroke and until the chisels are withdrawn.

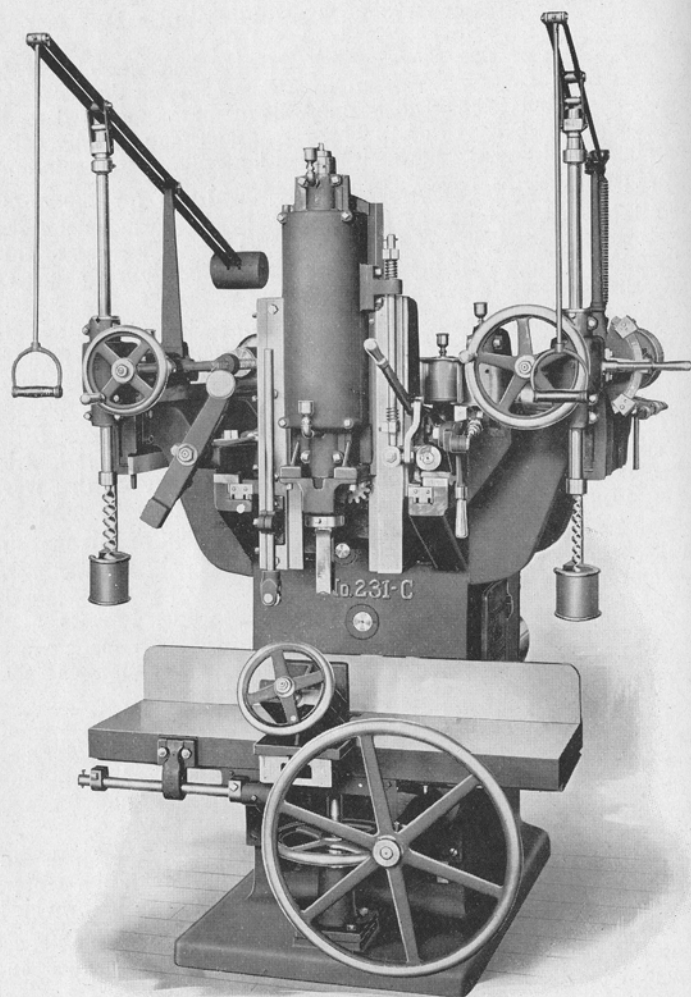
A **Compound Table** having 6-inch lengthwise movement can be furnished for making long mortises. A hand lever clamp is then provided for holding the stock in position.

The **Feed** is driven by a separate motor mounted on a support within the frame. The table feeds continuously, but is under perfect control of a hand lever for instantly stopping or starting. Feeding speeds can be furnished to suit the work, and feeds of from 7 to 28 strokes per minute are possible.

The **Range** is regularly for mortises on from 4 to 50-inch centers, although on special order a frame for 72-inch maximum centers can be furnished. Any required number of heads can be provided.

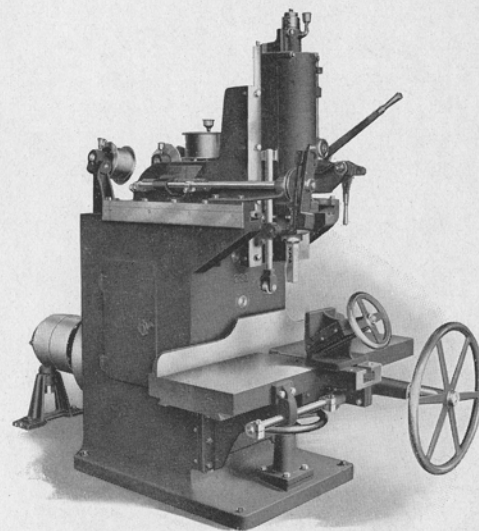
The **Equipment** includes one chisel and bit for each spindle, set of chisel bushings, adjustable thrust bit bushings, wrenches and the complete electrical equipment.

No.	No. of Spindles	Floor Space	Wt. in Lbs.	Code
212-M	3	6' x 5'6"	4300	MAINMAST
212-M	4	6' x 5'6"	4425	MAINSAIL
212-M	5	6' x 5'6"	4550	MAINSHEET
212-M	6	6' x 5'6"	4675	MAINSRING



No. 231-C Vertical Hollow Chisel Car Mortiser

No. 231-B has one Boring Attachment



No. 231

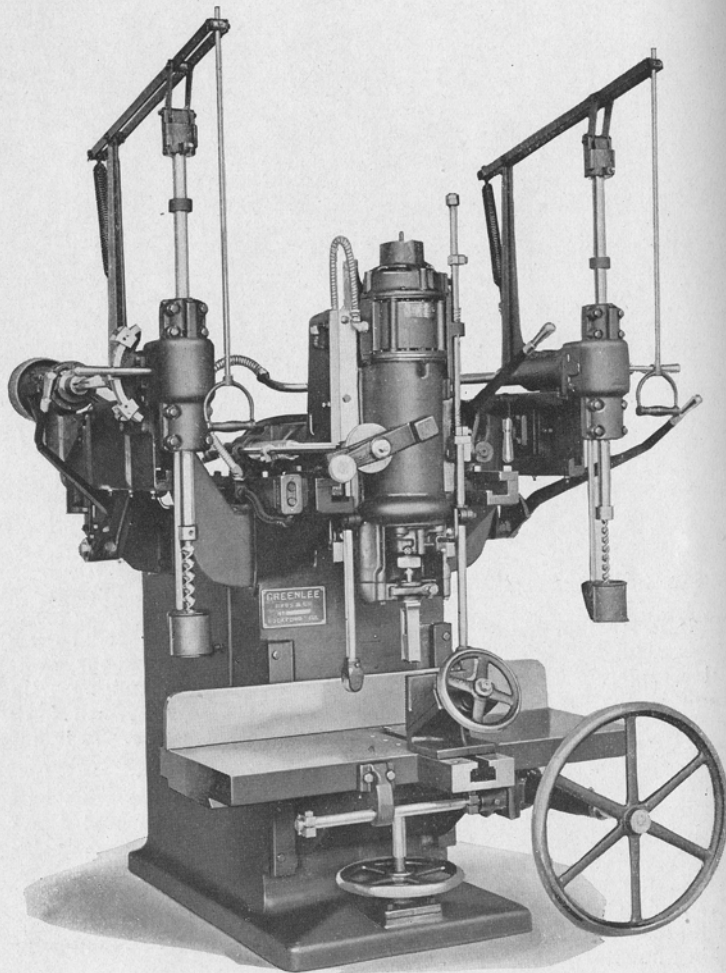
No. 231 Medium Vertical Hollow Chisel Car Mortiser

THIS Medium Mortiser with short compound table and boring attachments is a popular type for the smaller car shops, as it will completely frame average car timbers in one handling. Its range is for 1 $\frac{3}{4}$ -inch chisels and 14-inch wide by 16-inch high timbers. Boring Attachments will handle 2 $\frac{1}{2}$ -inch bits. It is entirely self contained and arranged for belt or motor drive.

The Design embodies belt driven mortiser spindle with ball bearing thrust, belt release lever to stop the mortiser and allow the boring attachments to run alone, automatic feed mechanism entirely enclosed within the frame, lever control to start, stop or reverse the chisel stroke at any point, rapid return travel for chisel, adjustable mortising stroke up to 13-inch length, and also quick cross adjustment of chisel ram by a conveniently located self-locking handle.

No.	Style	Wt. in Lbs.	Code
231	No Boring Attachments	5100	MERGER
231-B	1 Boring Attachment	5750	MERGER-ODOR
231-C	2 Boring Attachments	6400	MERGER-ODIST

Complete descriptive circular will be sent on request



No. 232-MC Vertical Car Mortiser with Built-In Motor

Also built with hand-feed traveling table
and with one or no boring attachments



No. 232-M Vertical Hollow Chisel Car Mortiser With Built-in Motor on the Bit Spindle

EXCEPT for the method of drive, this Car Mortiser closely follows the design of the No. 231, but its size and range is between that of the No. 231 and No. 238. It has the same chisel and timber capacity as the No. 232 Belted Spindle Mortiser shown on the following page, and is of the same design with reference to the frame and tables. It also has the same type of feeding mechanism, which is fully enclosed within the frame.

Built-in Motor Drive is one of the outstanding features of this machine, since it eliminates the long spindle belt. This drive reduces the cost of maintenance, lowers the power consumption and requires less floor space. The feed and boring attachments are driven from a separate motor mounted on top of the machine frame. Independent operation of mortiser and attachments are had, as on the belted No. 232. Other features include ball bearings for the bit spindle, also improved types of tool holders.

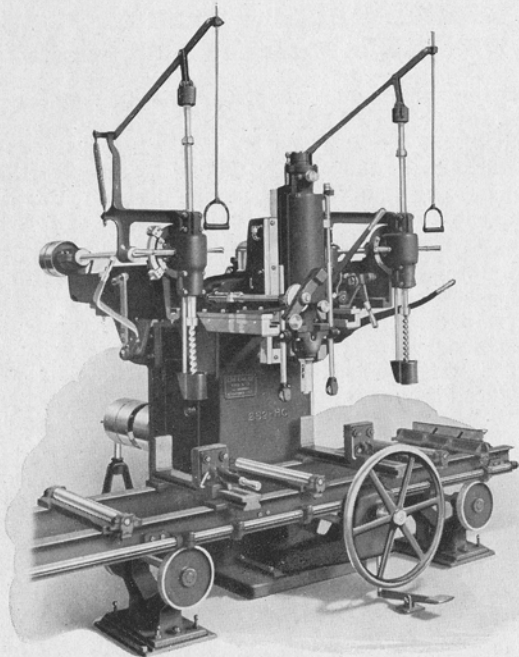
The Built-in Motor is fully enclosed within the chisel ram, but is provided with a blower for forced ventilation, which also furnishes an air blast for chip removal. It is regularly furnished for 220 or 440 volt alternating current and provides ample power for chisels up to 2-inch size. Its speed is 3600 R. P. M.

The Mortising Ram is carried in a housing having cross adjustment on anti-friction rollers by means of a coarse screw with a self-locking handle. It reciprocates under the control of automatic stops, but a hand lever is provided to start, stop or reverse it at any point. The stroke is adjustable up to 17 inches and the stops can be set for a short stroke at the table level or for mortising in the top of a 16-inch timber.

The Table can be of the compound type shown, or a traveling steel table as pictured on the next page. The latter is usually furnished in lengths of 10 or 12 feet and has hand feed.

The Range is for chisels up to 2" size, for handling timbers up to 18 inches wide by 16 inches high, and for boring with bits up to 3-inch or larger diameter.

No.	Style of Table	Boring Attachments	Code
232-M	Compound	None	MILLER
232-MB	Compound	1	MILLER-ODOR
232-MC	Compound	2	MILLER-ODIST
232-MH	Traveling	None	MILLERITE
232-MHB	Traveling	1	MILLERITE-ODOR
232-MHC	Traveling	2	MILLERITE-ODIST

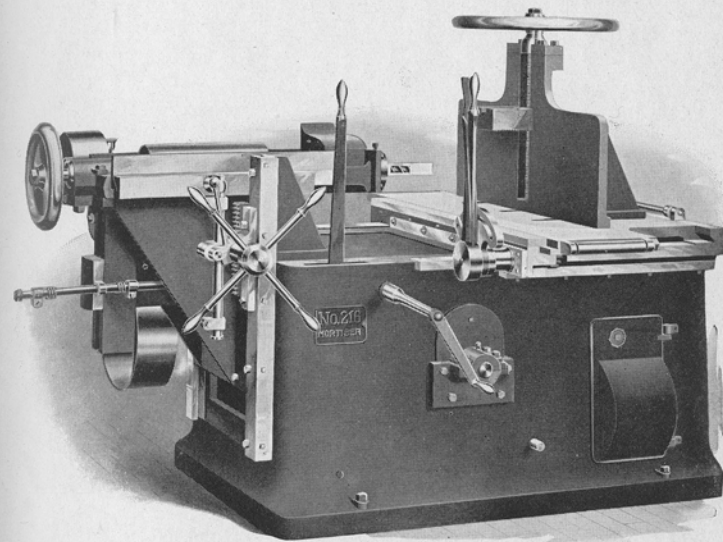


No. 232 Vertical Hollow Chisel Car Mortiser

THIS Car Mortiser is of the same general design as the No. 232-M shown on page 36, except for the spindle drive which is by belt. It is built with either a compound table or a long hand-feed traveling table which permits its combination with our Automatic Gainer or Standard Car Borers. The range is for mortising with chisels up to 2 inches square, for boring with 3-inch or larger bits and for handling timbers up to 16x18-inch.

No.	Style of Table	Boring Attachments	Code
232	Stationary	None	MERIDA
232-B	Stationary	1	MERIDA-ODOR
232-C	Stationary	2	MERIDA-ODIST
232-H	Traveling	None	MERIDALE
232-HB	Traveling	1	MERIDALE-ODOR
232-HC	Traveling	2	MERIDALE-ODIST

Complete descriptive circular will be sent on request



No. 216 Heavy Horizontal Car Mortiser

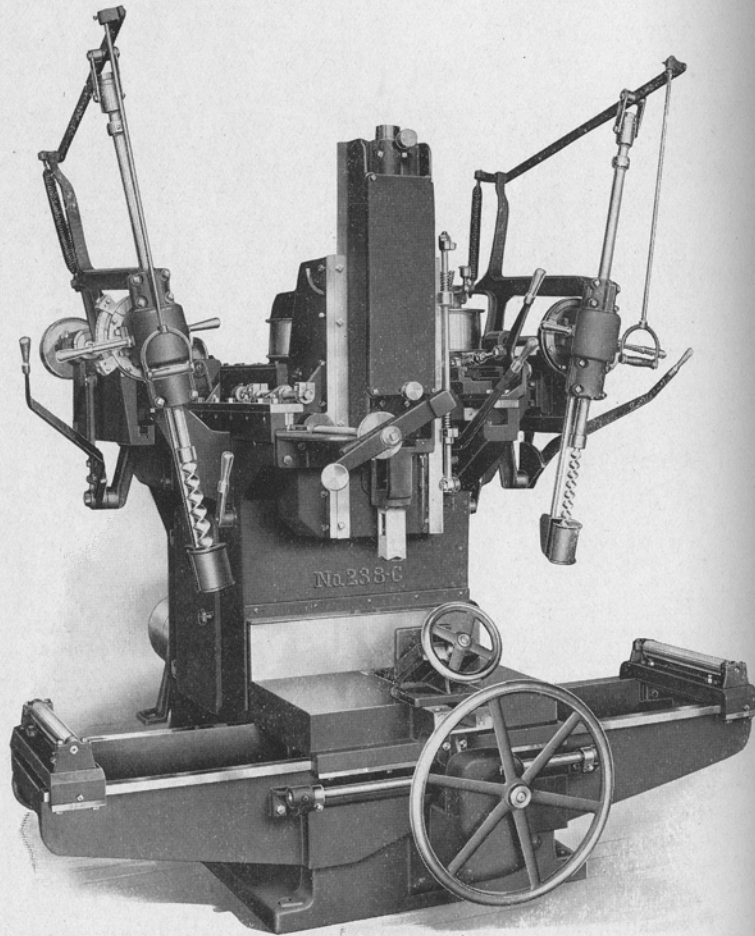
THE exclusive use of this No. 216 Horizontal Mortiser by most railway car building companies, is because of its rapid handling of duplicate mortising for new car construction. It is also widely selected for repair shops that are equipped with separate boring machines.

Its Superiority is due to the totally enclosed feed mechanism, large slow running frictions for the two feeding speeds and quick reverse, ease of adjustment of the chisel ram for double mortising, and the automatic feed with control for starting, stopping or reversing the ram from any position. The timber lays directly before the operator and the chips fall from the mortise. Lay-out stops gauge the movements for each operation.

The Range is for chisels up to 2½-inch square with 6½ or 8-inch blade, and working timbers up to 14x16-inch size. The base drive shaft of machine may have tight and loose pulleys, or flexible motor coupling.

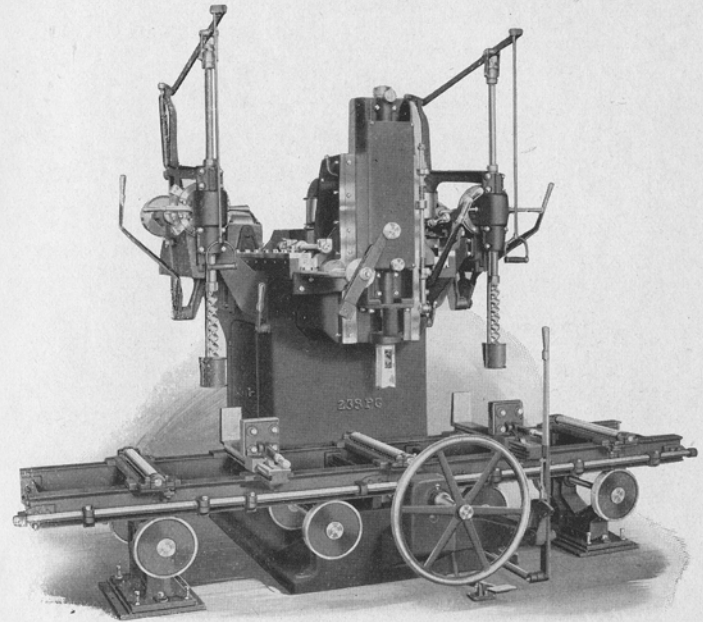
No.	Floor Space	Wt. in Lbs.	Code
216	7'6" x 5'6"	5600	MANIFEST

Complete descriptive circular will be sent on request



No. 238-C Extra Range Vertical Hollow Chisel
Car Mortiser with Stationary Table

The table has a sliding clamping center
section with lengthwise travel by hand wheel.



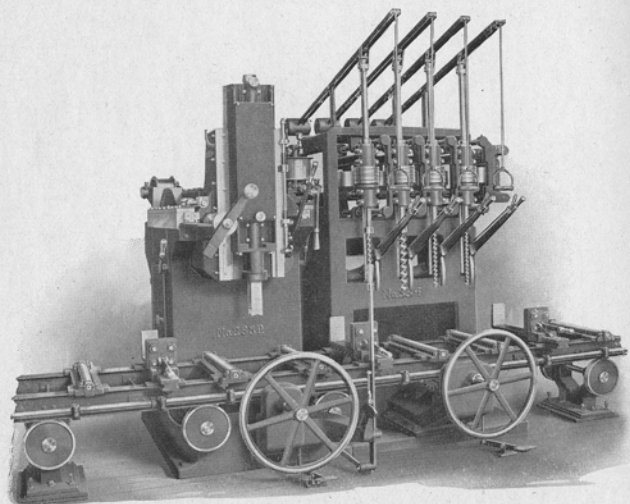
No. 238-PC with Power Feed Traveling Table

No. 238 Extra Range Vertical Car Mortiser

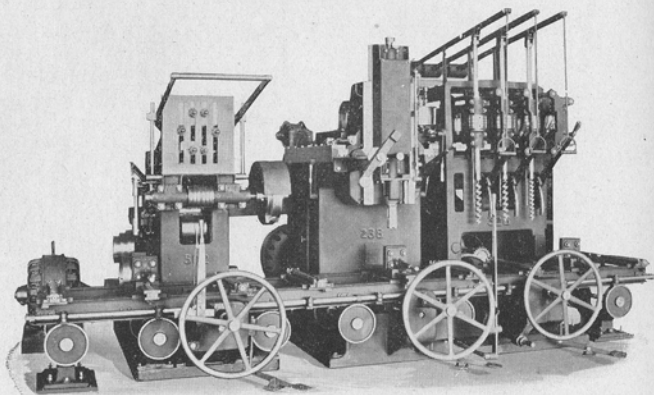
THIS design is the climax in Vertical Car Mortiser development. It is entirely self contained for belt or motor drive, and boring attachments, when added, may be operated independently. Among other perfected details are the enclosed feed mechanism running in oil, automatic feed with control for starting, stopping or reversing the stroke, ball bearing thrust for spindles, and cross adjustment of ram by self locking handle. The mortising range is for 2½ or 3-inch chisels and 18x20-inch timbers. The boring spindles handle 3-inch or larger bits.

No.	Style of Table	Boring Attachments	Code
238	Stationary	None	MERLE
238-B	Stationary	1	MERLE-ODOR
238-C	Stationary	2	MERLE-ODIST
238-P	Traveling	None	MERLUCE
238-PB	Traveling	1	MERLUCE-ODOR
238-PC	Traveling	2	MERLUCE-ODIST

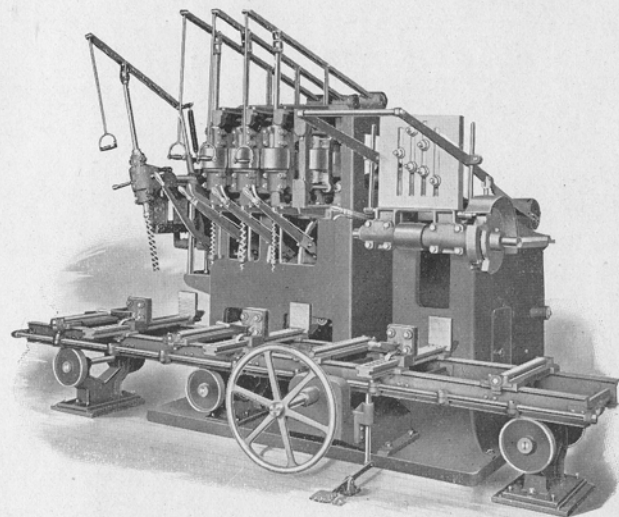
Complete descriptive circular will be sent on request



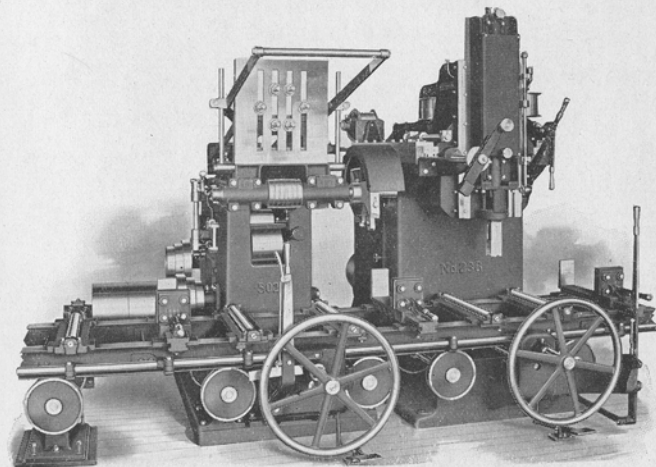
No. 238 Mortiser combined with No. 334 Car Borer



Combined No. 502 Gainer, No. 238 Mortiser and No. 328 Borer



No. 329 Car Borer combined with No. 502 Gainer



No. 502 Gainer combined with No. 238 Mortiser