GOODELL-PRATT

1500 GOOD TOOLS

Goodell-Pratt Light Shop Equipment with Motor Drive

Goodell-Pratt Light Shop Equipment
with
General Electric Motor Drive

The last few years have seen a large increase in the number of Home Work Shops. Varied and important influences have brought about this result.

The "Arts and Crafts" movement and the rapid growth of Manual Training Schools have developed a large and wide-spread group of workers, daily becoming more skilled in "tooling" metal and wood.

The labor scarcity of the World War with its aftermath of soaring prices induced thousands of home dwellers to put a few well invested dollars into tool kits and thus become their own "repair men".

The automobile, radio, the ever growing use of household labor saving devices, even the widely increased popularity of mechanical toys have made home work shop enthusiasts of many a "father and son."

The Home Work Shop is, therefore, the natural outcome of an age essentially mechanical and among a people whose bent is toward tools, whose love of tinkering is innate, and where the "do-it-yourself" idea carries an especial appeal. There is no greater pleasure or satisfaction than seeing the object of your creation grow to completion.

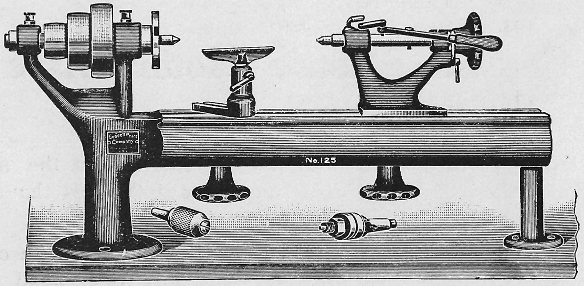
From electricity as the most popular of illuminants, in due time came home power in the form of the motor driven vacuum cleaner, the electric fan, the washing or sewing machine, etc., these to be rapidly followed by the present-day wide variety of reliable and efficient household labor-saving devices.

Their unusual ease of installation, modest first cost, trifling expense to operate; safety, cleanliness, ease of operation and control are factors combining to make electric motors the ideal selection as the driving power back of essentially all labor saving machines including the Goodell-Pratt "light shop" equipment to be described herein.

The ever-increasing demand for Goodell-Pratt power driven machines and the many inquiries received as to the proper selection of the accompanying motors have led to the issuance of this booklet.

For complete information and details covering equipment not mentioned in this booklet and our other 1500 Good Tools, refer to our complete catalog, a copy of which we will gladly forward on request.

Power Bench Lathes



The No. 125 Bench Lathe

Lathe	G. E. Motor Data*		
	Type	H.P.	Speed†
No. 125—12″ centres, 7″ swing	SA SD RSA RKT	¼	1800
No. 494—18″ centres, 7″ swing	SA SD RSA RKT	¼	1800

The Standard Drive for these lathes involves use of our No. 130 Countershaft installed between the three step cone pulley on the lathe headstock and a line shaft. This allows reduction of the motor speed from 1800 RPM to 750 RPM on the countershaft. By shifting the belt between the countershaft and the headstock step pulleys any one of three lathe speeds may be made immediately available: *i.e.,* 325, 750, or 1750 RPM. These speeds give sufficient ranges for all classes of work.

The ¼ H.P. G. E. Motor recommended is ample to operate either the No, 125 or 494 lathe with intermediate shafting when working to full capacity on machine steel or hard wood. The ¼ H.P. unit also has reserve power to drive any one of the following lathe attachments to their full capacity:

No. 166 **Screw Cutting Attachment** (must be ordered at same time as lathe). Attachments supplied with master screws for any lead, 24 threads to the inch standard.

No. 522 **Milling Attachment.** Permits all kinds of small milling, can be quickly clamped on lathe. 7″ Table has 5″ cross movement, longitudinal movement 1¼″, vertical movement 1¾″, three way hand feed wheels. See page 11.

* See pages 8 and 9 for data covering selection of electric motors, types, etc.

† **Note.**—The motor speeds given in this and following cases are "no load" speeds. The "full load" speeds drop approximately 4% (example: 1800 no load to 1725 full load)

No. 128 **Turret Attachment.** Turret 3″ diameter with 6 ½″ holes, attachment permits economical turning out of small duplicate parts.

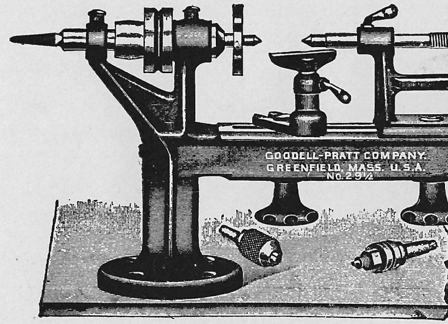
No. 194 **Sawing Attachment.** Consists of Saw Arbor for 5″ Saw, adjustable table with two guides, position of table easily adjustable.

No. 741 **Fret Saw Attachment.** Frame carries 6″ coping saw and has 8½″ throat. Corrugated table locks at any angle. A thoroughly practical little saw. See page 11.

Note: Other attachments for the No. 125 or 494 lathes are Slide Rest, Lathe Tools, Compression Chucks, Milling Attachment Vise, etc. Full information on request.

A typical lathe set up will be found on page 13.

Power Polishing Lathes



The No. 29 Polishing Lathe

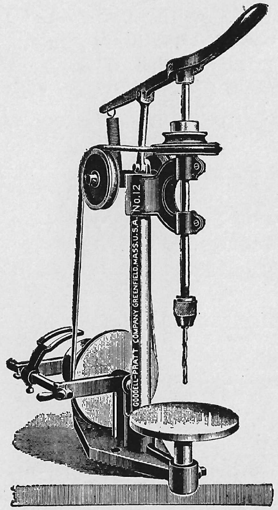
Polishing Lathes	G. E. Motor Data		
	Type	H.P.	Speed
No. 29 —3½″ between centres, 5″ swing	SA SD RSA RKT	¼	1800
No. 29½—3½″ between centres, 5″ swing	SA SD RSA RKT	¼	1800

These lathes permit a large variety of polishing, Grinding, and similar operations not possible with ordinary styles of polishing heads.

Lathes are furnished complete with Tail Stock, Tee Rest, Face Plate, Saw Arbor, and a Three Jawed Chuck.

These little lathes can be directly belted from the motor if desired, or belted from a line shaft as may best suit conditions. To belt direct from the motor a two step cone pulley to correspond with the one on the lathe must be installed on the motor in place of the plain pulley.

Cone pulleys furnished (not bored for motor shaft) at reasonable prices. Pulley ratio should not be greater than 17 to 10 to have the spindle speed of the lathe not exceed 3000 RPM.



The No. 12 Power Bench Drill

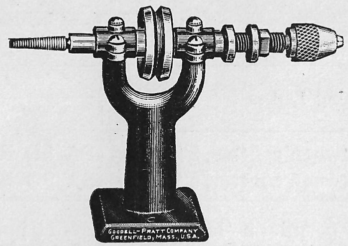
Power Bench Drills

The No. 12 is a good quality, low priced, sensitive drill for light work. Machine fitted with 3-jaw steel chuck for drills up to ¼″ diameter. Spindle can be set for movement ¾″ or less. Two speeds by shifting round belt, also provided with idler pulley and belt shifter.

Individual drive for maximum capacity. If driven from line shaft, motor should have sufficient capacity to deliver ⅛ H.P. at the tool.

Bench Drill	G. E. Motor Data		
	Type	H.P.	Speed
No. 12	SA SD RSA RKT	⅙	1800

Power Polishing Heads



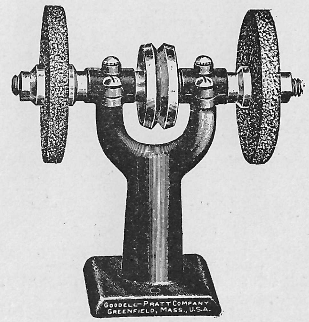
The No. 24 Polishing Head

Polishing Head	G. E. Motor Data		
	Type	H.P.	Speed
Nos. 21 22	SA SD RSA RKT	¼	1800
Nos. 23 24 27 43 28 31		¼	1800

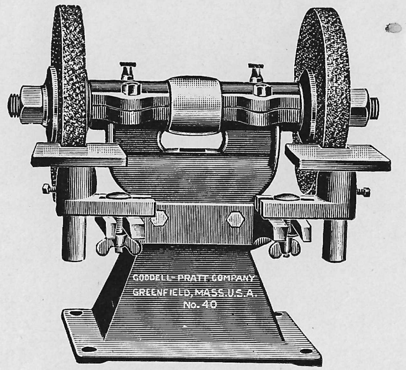
The preceding and following tabulations covering Polishing and Grinding Heads enable users to select the type and size best suited to individual needs. All heads provided with adjustable boxes. Pulleys will take flat belts, but smaller sizes are grooved for round belts if desired. Certain heads (as shown in cut) are provided with 3-jaw chucks.

With the exception of No. 27 and No. 43 which require ¼ H.P. these polishing heads may be individually driven from the above motors or line shaft drive may be used with motor capacity sufficient to deliver the H.P. at the tool indicated above for individual drive.

Power Grinding Heads



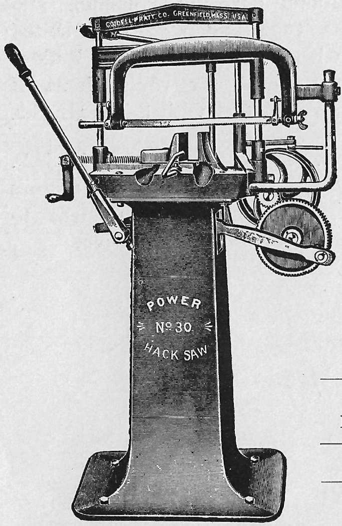
The No. 25 Grinding Head



The No. 40 Grinding Head

Grinding Heads	G. E. Motor Data		
	Type	H.P.*	Speed
Nos. 25 25½ 26	SA SD RSA RKT	¼	1800
Nos. 26½ 38 40	SD RSA RKT	½	1800

* Line shaft drive may also be used with motor capacity sufficient to deliver at the tool the H.P. indicated for individual drive.



The No. 30 Power Hack Saw

Power Hack Saw

This practical saw has a vise with capacity for sections $4\frac{1}{2}$ x $4\frac{1}{2}$ inches or smaller. Frame takes either 10 or 12 inch blades. Tight and loose Pulleys 7 inches in diameter. Pulley should run 150 R.P.M. giving 50 strokes per minute. For individual drive to maximum capacity use $\frac{1}{6}$ H.P. motor.

Power Hack Saw	G. E. Motor Data		
	Type	H.P.	Speed
No. 30	SA SD RSA RKT	$\frac{1}{6}$	1800

Electric Drive
and
The Selection of the Proper Motor

The benefits and economies of electricity as a motive power are so universally appreciated that no extended listing of advantages is necessary.

In silence of operation, freedom from odor, smoke, dust, flying oil or other disadvantages, the electric motor stands without a competitor.

Motors are instantly "on the job" at top speed at the mere closing of a switch. Motors "fit" anywhere—especially the little fellows used for driving Goodell-Pratt tools. Ease of control—stop, start, reverse, speed change—is practically perfect.

Belts, pulleys, hangers, gears, etc., may be entirely eliminated or reduced to the minimum. Accident or fire risk with electric motors is negligible.

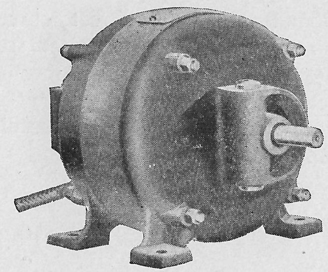
In a well laid out electric drive, the power used (and paid for through the customer's electric meter) is closely proportioned to the actual work performed. Electric motors involve no "warming up" losses, (developing full power the minute brought up to speed) load removed or applied causes an automatic decrease or increase in the

"energy," *i.e.,* electric current consumed; motors may be instantly shut down when no work is being done. Electric power is exceedingly economical, in fact electric power is only uneconomical where wastefully used or the motor improperly selected as to size, type, or speed.

Choice of the right motor is largely influenced by the work to be done. As operating conditions vary greatly, motors of different types have been designed to render the best results under known conditions of service. Actual working tests have determined the "type" *i.e.,* Manufacturer's designation as to method of winding used and size (horsepower) of the motors required to operate the Goodell-Pratt tools listed in the preceeding pages.

Through the courtesy of the General Electric Company we illustrate and describe the various types to which we have referred as applicable to the machines listed in this publication.

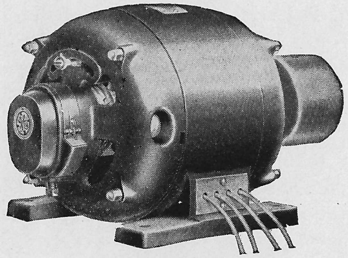
Type "SA" single phase, alternating current motors are made from $\frac{1}{20}$ to $\frac{1}{4}$ H.P., speed 1200 to 1800 R.P.M.* They are adaptable for machines where the starting and running (torque)** conditions are not severe. Motors are provided with wick oiled bearings and require practically no attention over long periods of operation.


A Type "SA" Motor

* The various types of General Electric motors herein described are built for speeds of either 1800 or 1200 revolutions per minute (RPM). Since the weight, bulk and cost of a motor increases with decrease in speed for a given output, where the speed of the driven machine permits—or a speed reducing countershaft may be interposed—it is usually more economical to purchase the higher speed motor. Hence it will be noted that 1800 RPM motors are recommended for the Goodell-Pratt tools listed.

** Torque (the "twist," "drag," "pull," or "turning moment" exerted on the surface of the rotating member or armature and tending force (in pounds pull) at the motor shaft required to start a given load—"running torque" the pounds pull exerted when motor is running at normal speed. Motor torque is usually expressed in "foot pounds," that is, the number of pounds "pull" at one foot radius. Torque is but one factor of horse power, speed and time also being necessary to determine the rate of work performed which is the "horsepower." If we have measured the foot pound torque the horsepower is then obtained by the simple formula:

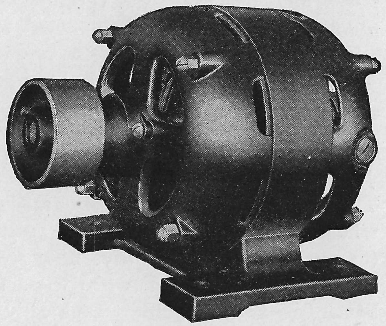
$$\text{H.P.} = \frac{\text{Torque} \times \text{Speed } (\textit{i.e.}, \text{RPM})}{5250}$$



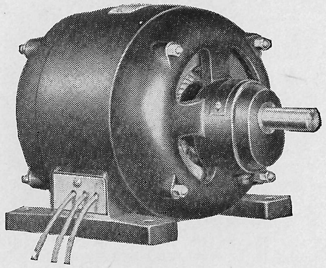
A Type "RSA" Motor

Type "RSA" **single phase,** alternating current motors are built in sizes from 1/12 to 3/4 H.P. These motors are "high torque" constant speed and are especially suited for application to pumps, compressors, grinders, meat choppers and other devices requiring high starting and running torque. RSA motors have oil ring bearings—a thoroughly sturdy product built for hard and continuous service.

Type "SD" (series or compound wound for direct current circuits) are made in sizes from 1/20 to 3/4 H.P. and are mechanically* interchangeable with corresponding ratings of the preceding SA line.



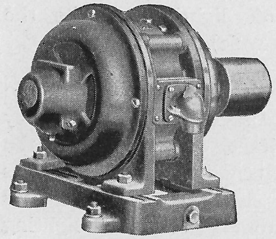
A Type "SD" Motor



A Type "RKT" Motor

"RKT" and "RKQ" motors are designed for operation on "polyphase," *i.e.,* in contradistinction to SA and RSA "single phase" alternating current circuits. They closely resemble the RSA line in general appearance and external construction. Sizes 1/12 to 1/2 H.P.

* By "mechanically interchangeable" is meant that, for example, should you wish to change a type SD motor for a type SA—the essential mechanical features such as dimensions of pulley, motor frame, base and holding down bolt spacings, etc., will be the same—thus one motor can *mechanically* (but not *electrically*) take the place of a "mechanically interchangeable" unit.



A Type "KT" Motor

Types "KT" and "KQ" are constant speed motors, designed for operation on polyphase circuits. These motors possess especially rugged and simple construction and have a wide range of application. Built from 1/4 to 20 H.P.

In ordering motors the following information should be given:

Note.—When placing an order for tools to be motor driven, the G.-P. Co. should be advised regarding the circuit conditions.

When in doubt as to the voltage, class of current, "single phase" "polyphase," direct current, etc., call up your electrical dealer or the local central station. In the larger proportion of cases you will find that your house circuit is "110 volts, single phase" (this for the small motors required for Goodell-Pratt machines, *i.e.,* 1/6 to 1/4 H.P.) Hence "SA" or "RSA" motors will be used for "single phase": if your circuit is "direct current" you will use "SD" motors: if "three phase alternating" you will use the "RKT."

Give Type of motor (see preceding description of various General Electric motors).

Two constant speeds are normally used for small motor applications, *i.e.,* 1800 revolutions per minute (RPM) or 1200 RPM. The cost, bulk and weight of the higher speed motor is less than the slow speed motor and the former selection is preferable when the pulley speed of machine or countershaft will permit.

Give Speed. Electric motors, depending upon winding, are made for "constant," "varying," "adjustable" speed, etc. A constant speed motor as the term implies, runs at practically constant speed, without load or with load, up to its rated horsepower capacity. "Varying speed" motors vary in speed as the load increases or decreases. "Adjustable speed" motors may be so controlled that a given speed or speeds may be held or adjusted at a fixed value independent of load (within the rated horsepower capacity of the unit involved). For the conditions required by Goodell-Pratt machines, constant speed motors fill all requirements.

Give Voltage (for "little" motors used off lighting circuits the voltage is usually 115, alternating current, 60 cycle).

Give Frequency (for alternating current circuits, this being the number of "alternations" in current per second). The usual frequency is "60 cycles" for house circuits. For "direct current" uses, the question of frequency does not enter. For alternating current circuits state whether for single, two or three phase. Again the small motors used by Goodell-Pratt tools are usually run from "two wire" lighting circuits, that is, "single phase".

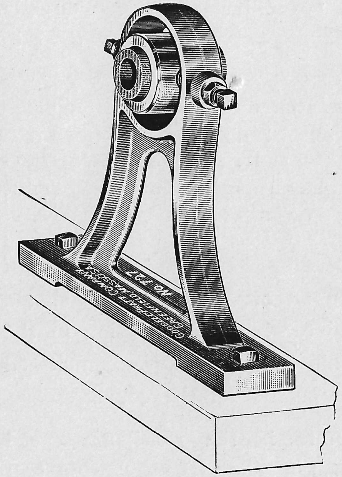
To simplify the problem of installing a small line shaft from which several combinations of Goodell-Pratt power driven tools can be belted, we have brought out and show in our catalogue an Aluminum Shaft Hanger, two different sizes of Aluminum Pulleys and the necessary Steel Collars, all for a ¾ inch line shaft.

The Belting Data which we have also incorporated in this booklet will be invaluable in making your power transmission problem as efficient as possible.

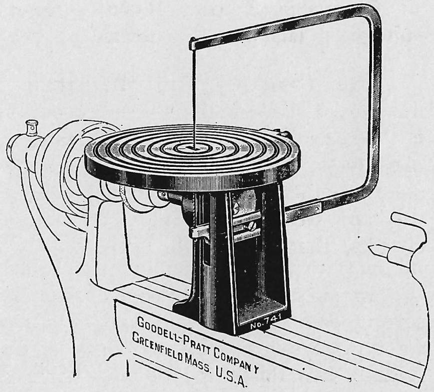
Belting Data

Advantage of Belting. Belt drive is one of the simplest, most widely used, and generally satisfactory forms of power transmission, provided sufficient distance may be allowed between the driving and driven centers; that water or moisture is not present to excess, and that an absolutely positive drive is not required.

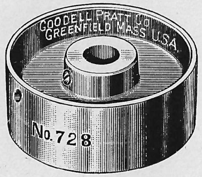
In the location of shafts that are to be connected with each other by belts, care should be taken to secure a proper distance one from the other. This distance should be such as to allow a gentle sag of the belt when in motion. Five times the diameter of the larger pulley will usually give a safe working distance between centers, assuming that the ratio of reduction is not too large. The following general rules may also be used; where narrow belts are to be run over small pulleys, 15 feet is a good average, the belt being allowed a sag of 1½ to 2 inches. For larger belts working on larger pulleys, a distance of 20 to 25 feet does well, with a sag of 2½ to 4 inches. For main belts working on very large pulleys, the distance should be 25 to 30 feet, the belts working well with a sag of 4 to 5 inches. If too great a distance is attempted, the belt will have an unsteady flapping motion, which will ultimately injure both the belt and machinery.



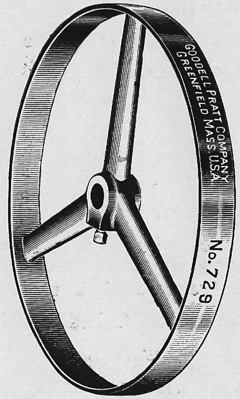
No. 727 Shaft Hanger



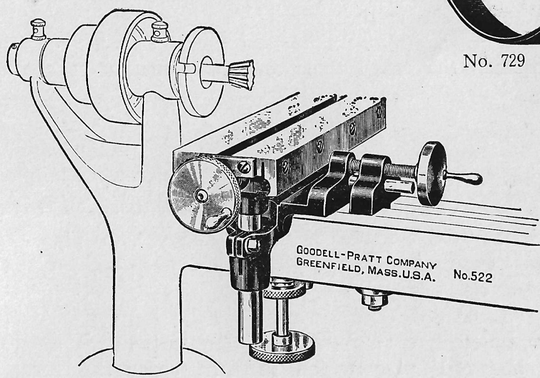
No. 741 Fret Saw Attachment



No. 728 Pulley



No. 729 Pulley



No. 522 Milling Attachment

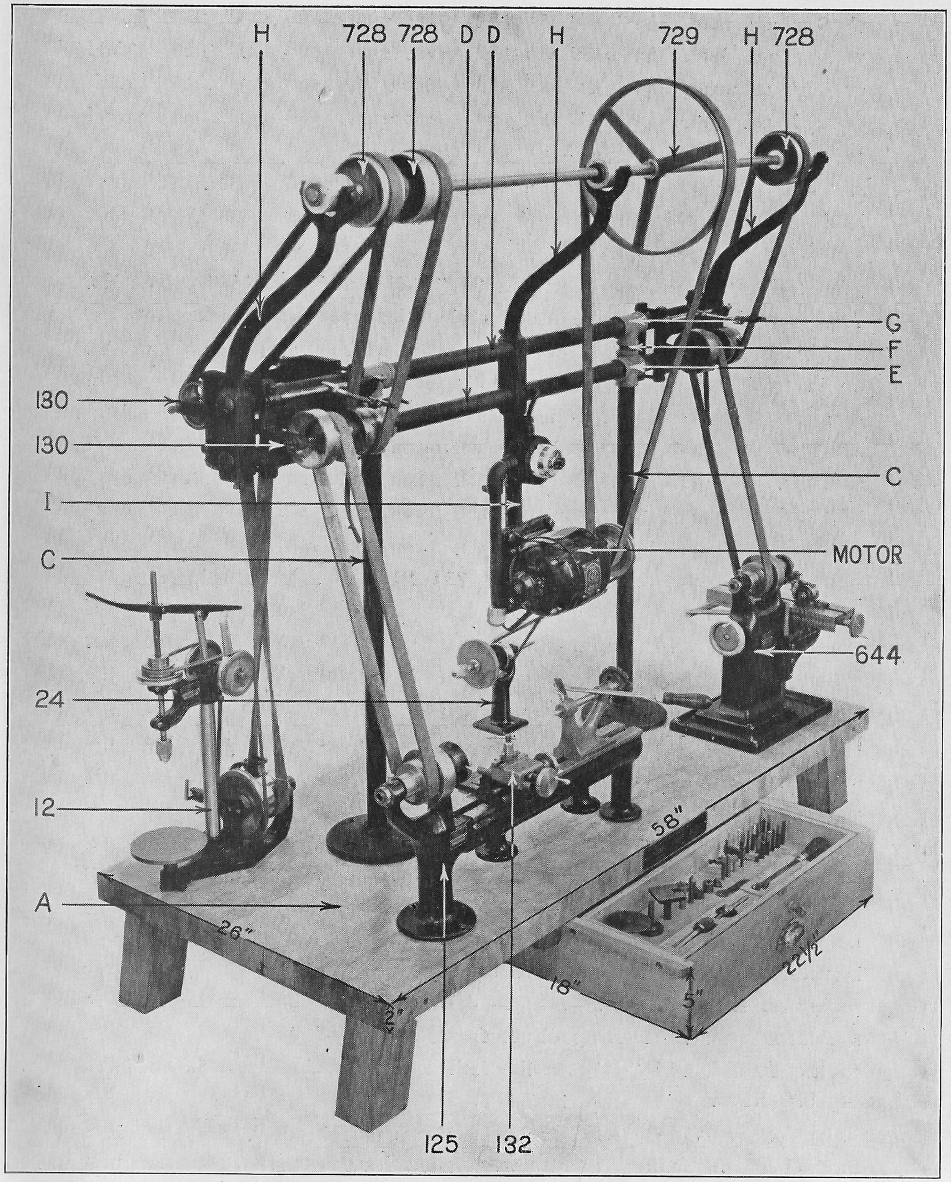
If possible, connected shafts should never be placed one directly over the other, as in such case the belt must be kept very tight to do the work. Where a vertical drive is imperative, belts should be of the best quality, well-stretched leather. It is desirable that the angle of the belt with the floor should not exceed 45 degrees. It is also preferable to locate the shafting and machinery so that belts should run off from each shaft in opposite directions, as this arrangement will relieve the bearings from the extra friction resulting when belts all pull one way. In arranging the belts leading from the main line of shafting to the counters, those pulling in an opposite direction should be placed as near each other as practicable, while those pulling in the same direction should be separated. This can often be accomplished by changing the relative positions of the pulleys on the counters.

Five thousand (5000) feet per minute is the maximum speed considered safe to operate belts. For good practice, the following belt reductions should not be exceeded:

1/15 H.P. motor	15 to 1
1 H.P. motor	10 to 1
5 H.P. motor	8 to 1
10 H.P. motor	6 to 1
20 H.P. motor	5 to 1
50 H.P. motor	4 to 1

An example of a typical small shop installation is shown on the opposite page. A heavy ash or oak bench "A", 26" x 58" x 2" with 4" x 4" legs, well braced to prevent vibration was used. This bench was fitted with a drawer 22½" wide, 18" long and 5" deep, to provide a handy place to keep the small tools and attachments for the various machines.

The superstructure was constructed of the following materials which can be procured easily from your hardware dealer or plumber: two cast iron flangs "BB", 7" diameter with 1" bore threaded to receive the two 28" uprights "CC", made of "XX" heavy iron pipe. At the top of the upper end of the uprights are two heavy type crosses "EE" with two heavy tees "GG", connected by means of two heavy 1" close nipples. Through the crosses and tees run the two 58" cross members "DD", made of heavy 1" pipe which in turn carry the three offset



shaft supports "HHH" and the No. 130 countershafts. These supports were made by a blacksmith at a very reasonable cost. The middle support also carries an extension on which the motor and its switch were hung. The three bearing blocks were made of aluminum and fiitted with oilless bushings.

The motor used is General Electric type S.B-1800 RPM. The full load speed of this motor is 4 per cent. less than its rated no load speed, or 1728 RPM.

The motor is equipped with a 2½" pulley and an 11½" pulley, No. 729, was used on the line shaft, giving the line shaft a speed of 375 RPM, as the speed is inversely proportional to the pulley diameters, or in this case as 2½" is to 11½". If the motor pulley were 5" in diameter and the driven pulley 10" in diameter the speed of the driven shaft would be just one-half the motor speed, if there were no belt slippage. To get a speed of 750 RPM. on the countershaft with its 2¾" driven pulley, the pulley on the line shaft must be just twice as large, or 5½" in diameter.

With a countershaft speed of 750 RPM the lathe spindle speed will also be 750 RPM when the belt is on the intermediate step of the countershaft and lathe pulleys, as they are both 2½" in diameter. When belted from the large step on the countershaft pulley to the small step on the lathe pulley the ratio is as 3½ is to 1½, giving a lathe speed of 1750 RPM. When belted from the small step on the countershaft pulley to the large step on the lathe pulley the ratio is as 1½ is to 3½, giving a lathe speed of 350 RPM.

These speeds do very well for general work, 1750 RPM being suited for turning brass, copper and alluminum, 750 RPM for cast iron and machine steel and 350 RPM for tool steel. Wood turning should be done on the 1750 RPM speed, or even higher. If a higher speed is wanted for wood working it could be secured by placing a large pulley on the line shaft so as to drive direct to one of the steps of the lathe pulley. Driving direct from a 10" pulley on the line shaft to the small or 1½" step on the lathe pulley would give a lathe speed of 2500 RPM.

If you encounter any special problems, are in doubt as to the best method of arranging your power transmission or the material best

suited to your requirements, the desired information will be gladly furnished by the Goodell-Pratt Company, or the General Electric Company through its offices located in the following cities and towns:

Atlanta, Ga., Citizens & Southern Bank Bldg.
Baltimore, Md., Lexington Street Bldg.
Birmingham, Ala., Brown-Marx Bldg.
Boston, Mass., 84 State St.
Buffalo, N.Y., Electric Bldg.
Butte, Mont., Electric Bldg.
Charleston, W. Va., Charleston National Bank Bldg.
Charlotte, N.C., Commercial Nat. Bank Bldg.
Chattanooga, Tenn., James Bldg.
Chicago, Ill., Monadnock Block
Cincinnati, Ohio, Provident Bank Bldg.
Cleveland, Ohio, Illuminating Bldg.
Columbus, Ohio, The Hartman Bldg.
Dallas, Tex., Interurban Bldg.
Dayton, Ohio, Dayton Savings & Trust Bldg.
Denver, Colo., U.S. National Bank Bldg.
Des Moines, Iowa, Hippee, Bldg.
Detroit, Mich., Dime Savings Bank Bldg.
Duluth, Minn., Fidelity Bldg.
Elmira, N.Y., Hulett Bldg.
El Paso, Tex., 500 San Francisco St.
Erie, Pa., Commerce Bldg.
Fort Wayne, Ind., 1600 Broadway
Grand Rapids, Mich., Commercial Savings Bank Bldg.
Hartford, Conn., Hartford Nat. Bank Bldg.
Houston, Tex., Third and Washington Sts.
Indianapolis, Ind., Traction Terminal Bldg.
Jacksonville Fla., Graham Bldg.
Joplin, Mo., Miners Bank Bldg.
Kansas City, Mo., Dwight Bldg.
Knoxville, Tenn., Burwell Bldg,
Little Rock, Ark., Southern Trust Bldg.
Los Angeles, Calif,, Corp. Bldg., 724 So. Spring Street
Louisville, Ky., Starks Bldg.
Memphis, Tenn., Exchange Bldg.
Milwaukee, Wis., Public Service Bldg.
Minneapolis, Minn., 410 Third Ave. North
Nashville, Tenn., Stahlman Bldg.
Newark, N.J., 671 Broad St.
New Haven, Conn., Second National Bank Building
New Orleans, La., Maison Blanche Bldg.
New York, N. Y., Equitable Building, 120 Broadway
Niagara Falls, N.Y., Gluck Bldg.
Oklahoma City, Oka., 1 West Grande Ave.
Omaha, Neb., Electric Bldg.
Philadelphia, Pa., Witherspoon Bldg.
Pittsburgh, Pa., Oliver Bldg.
Portland, Ore., Electric Bldg.
Providence, R.I., Turks Head Bldg.
Richmond, Va., Virginia Railway and Power Bldg.
Rochester, N.Y., Granite Bldg.
St. Louis, Mo., Pierce Bldg.
Salt Lake City, Utah, Newhouse Bldg.
San Francisco, Calif., Rialto Bldg.
Seattle, Wash., Colman Bldg.
Spokane, Wash., Paulsen Bldg.
Springfield, Mass., Third National Bank Building
Syracuse, N.Y., Onondaga County Savings Bank Bldg.
Toledo, Ohio, Spitzer Bldg.
Trenton, N.J., Broad St. National Bank Building
Washington, D.C., Commercial National Bank Bldg.
Worcester, Mass., State Mutual Bldg.
Youngstown, Ohio, Strambaugh Bldg.

For Hawaiian business refer to Catton Neill & Co., Ltd. Honolulu

We sincerely hope that this booklet will enthuse you over the possibilities of a small Motor Driven Home Workshop to the point of purchasing the motor and line shaft and such machines as will be of the most service to you. We envy you the fun of installing this equipment and the first turn of the switch that puts it in motion.

So sure are we that any of the machines shown in this booklet will endear themselves to you that we know you will be interested in the hundreds of other good tools we manufacture. A broad listing of these tools follows:

- Automatic Drills
- Reciprocating Drills
- Hand Drills
- Breast Drills
- Bench Drills
- Chain Drills
- Chucks
- Bit Braces
- Glass Cutters
- Hollow Handle Tool Sets
- Automatic Screw Drivers
- Plain Screw Drivers
- Ratchet Screw Drivers
- Reamers
- Countersinks
- Nail Sets
- Center Punches
- Cold Chisels
- Steel Letters and Figures
- Gimlet Bits
- Machinists' Hammers
- Automobile Sets
- Rim Wrenches
- Bearing Scrapers
- Valve Lifters
- Valve Grinders
- Washer Cutters
- Tap Holders
- Hack Saw Frames
- Hack Saw Blades
- Hand Vises
- Bench Vises
- Bench Grinders
- Polishing Heads
- Grinding Heads
- Carpenters' Tools
- Floor Scrapers
- Mitre Boxes
- Wood Levels
- Iron Levels
- Machinists' Tool Kits
- Steel Rules
- Combination Squares
- Rule Depth Gauges
- Micrometer Calipers
- Micrometer Depth Gauges
- Inside Micrometer Gauges
- Calipers and Dividers
- Speed Indicators
- Feeler Gauges
- Screw Pitch Gauges
- Center Gauges
- Surface Gauges

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