

*Irving T. Plunkett*

BULLETIN NO. 34

# What to Make on the Lathe



Price 10 Cents  
Postpaid to Any Address  
Coin or Stamps of Any Country Accepted

**SOUTH BEND LATHE WORKS**  
459 NILES AVE., SOUTH BEND, INDIANA, U. S. A.

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## Foreword

This booklet has been prepared to answer inquiries we receive from home workshop mechanics who ask for suggestions on what to make in the lathe and how the work should be done.

Blueprints and instruction sheets are available to aid the mechanic in making the projects and articles illustrated and described in this book. These blueprints and instruction sheets are fully described on page 22 and are prepared so that the mechanic can follow step by step in sequence the building of the project.

Only a few of the thousands of practical jobs that can be done in the lathe can be illustrated in this booklet. The Back-Geared, Screw Cutting Lathe is known as the universal tool because of the wide variety of work for which it can be used. A New England machinist once made the statement that more than 3000 different operations could be performed in the lathe. In addition to turning, boring, facing, drilling, cutting screw threads, etc., the lathe can be used for innumerable special classes of work, and when fitted with the necessary attachments almost any kind of machine work can be done.

South Bend Lathe Works

The Lathe referred to in the description of projects and models throughout this bulletin and shown in illustrations on the machining of various classes of work is a 9"x3" "Workshop" Back Geared, Screw Cutting Precision Lathe.

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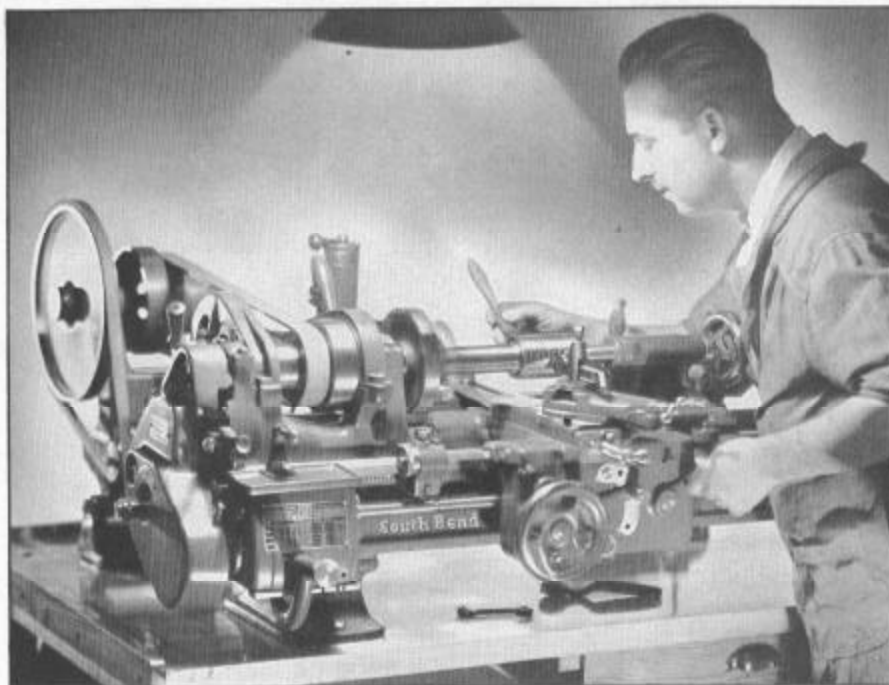


Fig. 1. Cutting Screw Threads in the Lathe.

## What to Make on the Lathe

### A Mechanical Era

The airship, airplane, automobile, radio and thousands of other modern inventions are all the result of a new era in mechanical and scientific development. Only the future can reveal the new methods, new machinery, new equipment and labor-saving devices that are to come. During the next twenty years the man who has mechanical training and experience will be very much in demand, and mechanical genius will be much sought after.

There are many excellent vocational schools in the United States where young men are given an opportunity to obtain elementary training in mechanical work of all kinds. This mechanical training and experience may be continued in the home workshop by those who are mechanically inclined

and have ideas to work out or inventions to develop.

The work that can be accomplished in the homeshop is limited only by the ability of the owner and the equipment of the shop. Resourcefulness and initiative can be developed and the inventive genius brought to light. Skill and experience in the use of precision tools can be developed.

The home workshop gives the mechanic an opportunity to become trained in the use of precision tools of all kinds and to develop his skill so that he can work with precision and accuracy. In order to be a master mechanic the workman must know what can be done in a Back-Geared, Screw Cutting Lathe and be able to do the work.

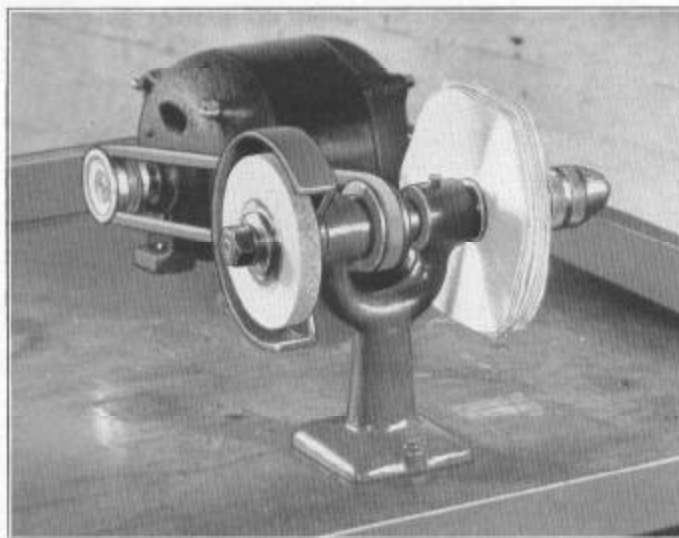


Fig. 2. Bench Grinder and Polishing Head.

## 4-inch Bench Grinder and Polishing Head Fitted with 4" x 1/2" Grinding Wheel and 6-inch Buffing Wheel

The bench grinder and polishing head illustrated above has a steel spindle and cast iron frame. Bronze bearings may be fitted into the frame for the spindle if desired. The net weight of the grinder complete with guard and pulley as shown above is 7 1/2 lbs.

A 1/6 H.P. or 1/4 H.P. 1725 R.P.M. motor should be used to operate the grinder. V-belt drive is used between the motor and the grinder spindle. The V-groove pulley on the motor should be about 2 1/4" or 3" in diameter for best results.

The grinder spindle may be fitted with various grades of grinding wheels suitable for different classes of grinding. The left end of the

spindle has flanges for a 4" x 1/2" grinding wheel with 1/8" hole. The right end of the spindle has similar flanges on which a buffing wheel may be mounted, or, if preferred, another grinding wheel.

The 1/2" right-hand 24-thread on the right end of the spindle permits mounting a drill chuck, polishing and sanding disc, sanding drum, flexible shaft and a number of other useful attachments which may be purchased in any hardware store.

The grinder frame is well designed and heavily constructed. The bearings are very substantial for a grinder of this type, and if they are properly fitted will give excellent service. Hinged lid oilers should be used as they will prevent dirt and grit from working into the bearings.

This bench grinder and polishing head will be found very useful in the homeshop because it can be used for so many different kinds of work, including the grinding and sharpening of tools, polishing, buffing, drilling, sanding, etc.

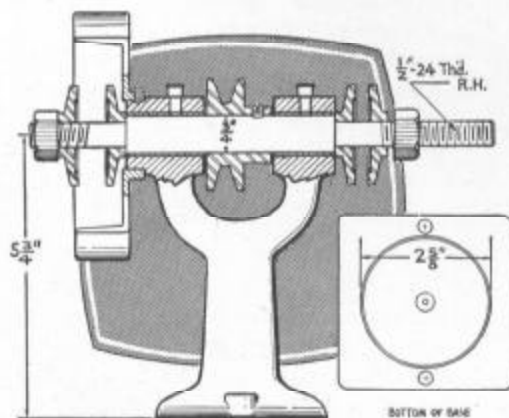


Fig. 3. Assembly Drawing of Bench Grinder and Polishing Head.

### Blueprints and Castings for Grinder and Polishing Head

No. CN500B. Set of three blueprints. Size 12" x 18"	\$0.30
No. CN500A. Set of two typewritten instruction sheets	\$0.10
No. CN500C. Set of rough castings for grinder frame, flanges, pulley and guard. Shipping Weight 10 lbs.	\$1.80*

\*Note: Steel parts, emery grinding wheel, buffing wheel, chuck, and bronze for bushings are extra.



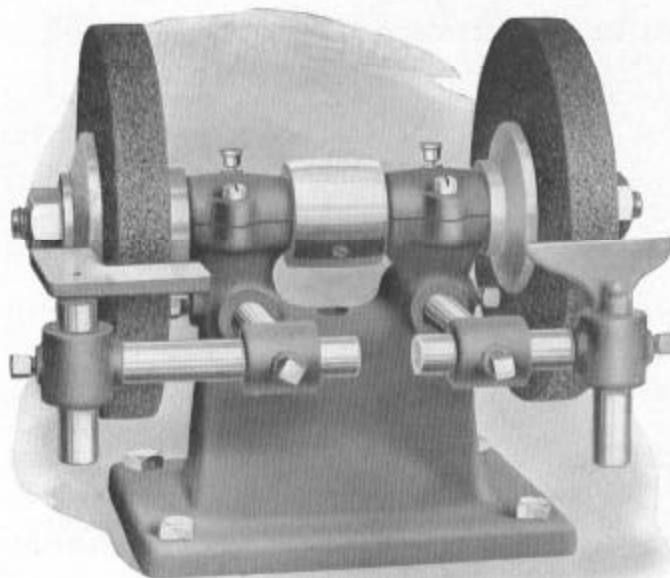


Fig. 4. 8-inch Bench Emery Grinder Completely Assembled and Ready for Use.

## Heavy Duty 8-inch Bench Grinder

Has Two Wheels 8-inch Diameter  $\frac{3}{4}$ -inch Face

This grinder is a practical tool for the machine shop. It has a heavy cast iron frame and a substantial spindle,  $\frac{3}{4}$ -inch in diameter, with babbitted bearings, 1-inch in diameter. Takes two grinding wheels 8" x  $\frac{3}{4}$ ". Height of grinder from center of spindle to the base is 6 $\frac{1}{2}$  inches. Size of base is 6 $\frac{3}{4}$ " x 9 $\frac{3}{4}$ ". Net weight of grinder is 40 lbs.

Fig. 4 above shows the grinder mounted on a bench although it may be mounted on a heavy cast iron pedestal as shown in Fig. 5 if desired. V-belt drive pulley can be substituted for the flat drive pulley for direct motor drive. A  $\frac{1}{2}$  H. P. motor is recommended although a  $\frac{1}{8}$  H. P. motor could be used.

### Blueprints and Supplies for Heavy Duty 8-inch Bench Grinder

#### Bench Grinder

No. SB536B.	Set of 5 Blueprints, size 12" x 16"	\$0.50
No. SB536A.	Set of 4 Typewritten Instruction Sheets	.20
No. SB536C.	Set of Rough Castings. Shipping Weight 40 lbs.	5.00
No. SB536D.	Steel and Hardware Parts. Ship. Wt. 10 lbs.	1.00
No. SB537C.	Set of 2 Grinding Wheel Guard Rough Castings. Shipping Weight 15 lbs. Price complete	1.75
No. SB66.	Complete set of 5 Blueprints, 4 Instruction Sheets, Rough Castings, Steel and Hardware for Grinder. Shipping Weight 65 lbs.	8.45

#### Bench Grinder Floor Column

No. SB66 $\frac{1}{2}$ .	Set of 3 Blueprints, 1 Instruction Sheet, Rough Castings, Steel and Hardware for Column only. Shipping Weight 90 lbs.	\$12.50
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#### Bench Grinder Countershaft

No. SB67.	Set of 4 Blueprints, 4 Instruction Sheets, Rough Castings, Steel and Hardware for Countershaft. Shipping Weight 50 lbs.	\$7.10
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#### Bench Grinder, Floor Column and Countershaft

No. SB538.	Complete set of Blueprints, Instruction Sheets, Rough Castings, Steel and Hardware for Grinder, Column, and Countershaft. Ship. Wt. 205 lbs.	\$28.05
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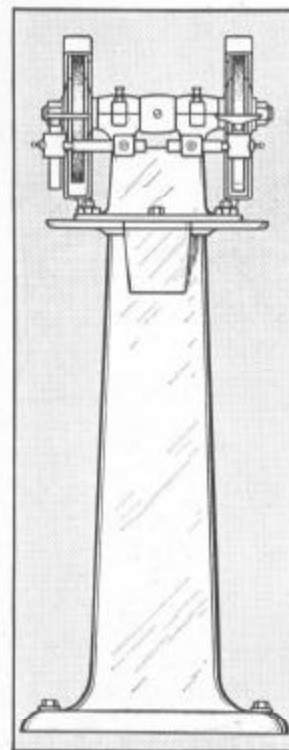


Fig. 5. Grinder Mounted on Heavy Cast Iron Pedestal.

## Miniature Gasoline Engine No. FB668

For Model Airplanes, Model Speed Boats, etc.

$\frac{1}{3}$  H. P. at 5000 R. P. M.

This miniature gasoline engine weighs only 14 oz., yet it develops  $\frac{1}{3}$  H. P. at 5000 R.P.M. Has  $1\frac{1}{16}$ " bore and  $1\frac{1}{8}$ " stroke.

The cylinder is aluminum alloy with die cast cooling fins and has a steel liner with machined valve ports for accurate timing. A propeller 16" to 20" in diameter may be used.

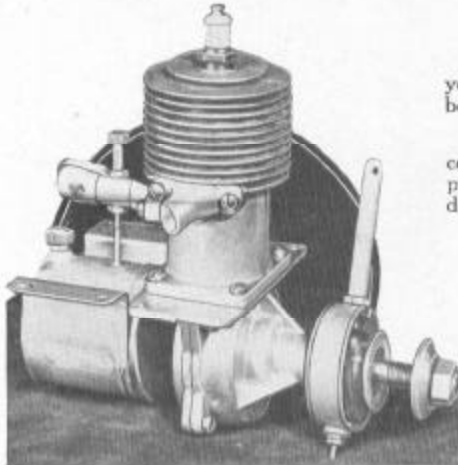


Fig. 6. Miniature Gasoline Engine No. FB668.  
See drawing and specifications below.

## Castings and Blueprints

Complete set of castings and supplies, including 2 blueprints, size 9"x11" and 4 instruction sheets (but without the spark coil). No. FB668. Shipping Wt. 2 lbs. **\$7.50**

Blueprints only for miniature gasoline engine listed above. No. FB669B. Shipping Wt. 8 oz. **\$1.00**

Miniature spark coil to operate on two or three flashlight batteries. No. FB669 \$2.75

## Installation Drawing and Specifications

ROCK: L-1718 in, straight; 1/4 in. dia. two ends.  
R. P. M.: Up to 3000.  
HORSE POWER: 1/2 at 2000 R. P. M.  
CYLINDER: Aluminum alloy, for better cooling.  
VALVES: Cast iron, with cast iron seats.  
CYLINDER LINER: Steel, with combined valve ports for economy of firing.  
VALVE SPRING: Alloy steel, light weight.  
PISTON RINGS: Two, cast iron, accurately machined.  
CRANK: Steel, 1 1/2 in. dia., hollow drilled.  
CONNECTING ROD: Special aluminum alloy, with both bearings bronze lined.  
CRANKCASE: Cast in two halves of aluminum.  
MAIN BEARING: Bronze, 1 in. long, 3/4 in. inside hole, for long wear.  
CRANK PINS: Steel, hardened for high speed.  
TIMING: Enclosed, automatic type breaker and contact points.  
TIMING: Keyed to crankshaft, yet easily removable.  
CARBURETOR: Adjustable, with feature not to hold choke open, tested.  
EPAK PLUG: 1/4 in.-23 thread, stainless A.

GAS TANK: Of sheet metal.

**SPARK COIL:** Miniature size and weight, operates on two to three flash light batteries, can be furnished.

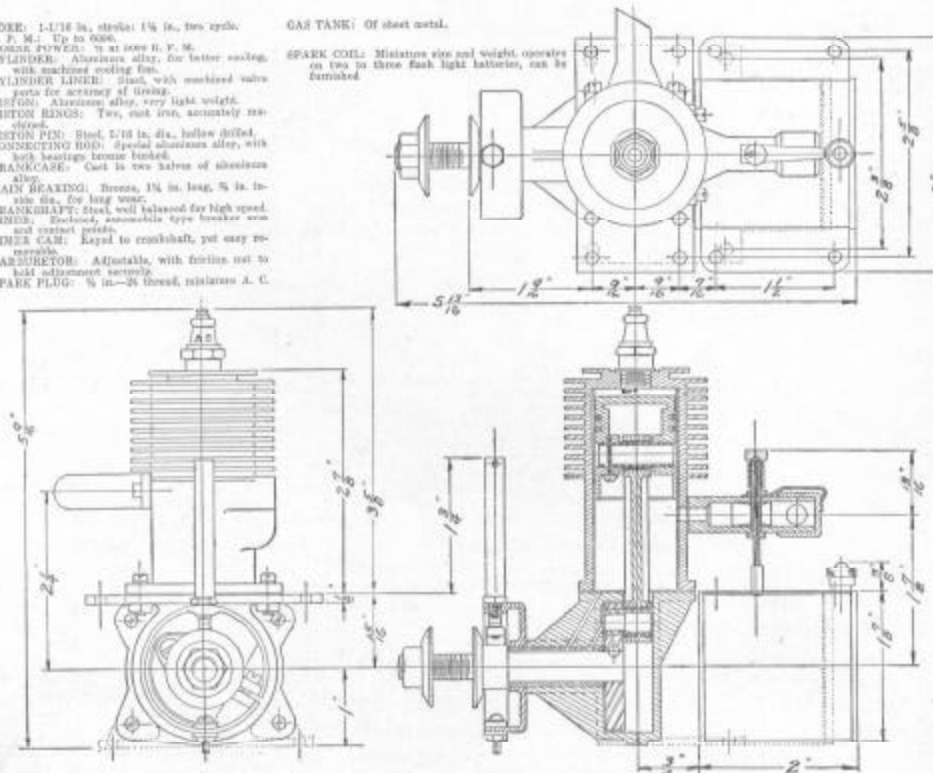


Fig. 7. Installation Drawing and Specifications for Miniature Gasoline Engine.

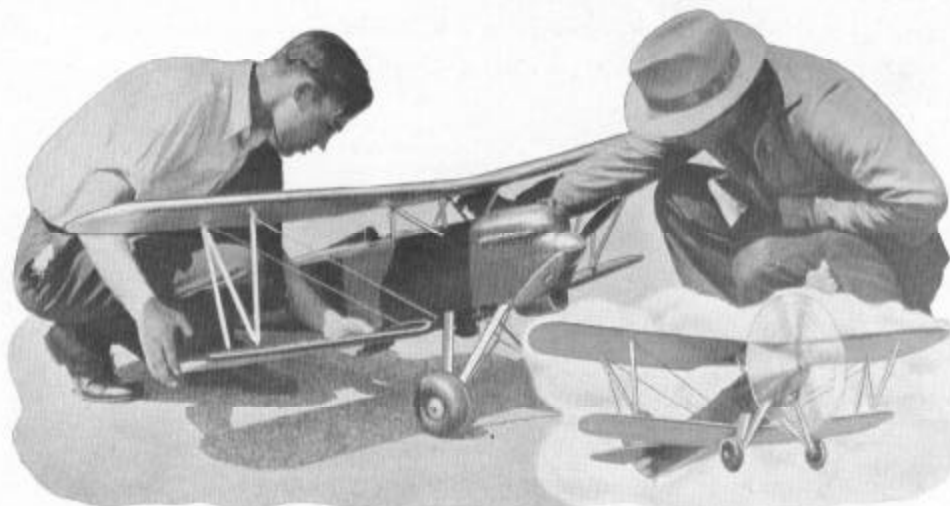


Fig. 8. This "Pursuit" Model Airplane is Powered with a Miniature Gasoline Engine.

## Flying Model Airplane Plans For Use with Miniature Gasoline Engines

The flying model airplanes illustrated on this page are all suitable for use with the No. FB668 Miniature Gasoline Engine, shown on page 4. These model airplane designs have all been tested and perfected. If the models are carefully constructed, satisfactory performance can be expected.

The construction and flying of gasoline powered model airplanes is a thrilling and educational hobby. A good model will fly about fifteen minutes on one tank of fuel. The controls may be set so that the plane will circle slowly around the flying field, and when the fuel is exhausted will glide to a gentle landing. For short flights, an automatic timer may be used to shut off the ignition.

### Plans and Instructions for Flying Model Airplanes

"Pursuit" Model. An unusually fine model biplane with 6 ft. wing spread. Has flown successfully with a 2 lb. load and made a perfect landing. Differs only in size and minor details from a real plane. Blueprints are well prepared and easy to read and give very complete instructions.

No. MM403B. Plans and Instructions.....\$2.00

The "Cavalier". A beautiful streamline model with 9 ft. wing spread.

No. FB689B. Plans and Instructions .....\$0.50

The "Buccaneer". An excellent flying model with 7 ft. 4 in. wing spread.

No. FB690B. Plans and Instructions .....\$0.50

The "K-G3". A consistent flyer. This fine model has a wing spread of 8 ft.

No. FB672B. Plans and Instructions .....\$0.50



Fig. 8A. "Pursuit" Model Airplane.

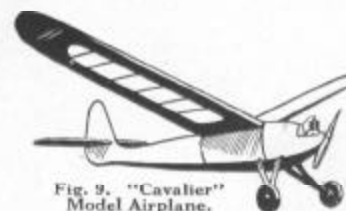


Fig. 9. "Cavalier" Model Airplane.



Fig. 10. "Buccaneer" Model Airplane.



Fig. 11. "K-G3" Model Airplane.

## Model Steam Traction Engine

Made by Edwin J. Davis



Fig. 12. Mr. Edwin J. Davis with His Prize Winning Model Steam Traction Engine.

Edwin J. Davis of Rockford, Illinois is shown in the illustration at the left with the excellent model of the steam traction engine which he constructed. This working model will operate under its own power and is well finished. In building this engine the only casting used was for the flywheel; all other parts were machined in a 9-inch swing lathe from cold-rolled stock and solid brass bushing stock.

This model steam traction engine received the second prize award for excellence in model making at the National Handicraft Exhibition and Contest held at Chicago, Illinois, in 1935 by the National Homeworkshop Guild.

A series of articles describing and illustrating this prize winning model engine appeared in "Model Craftsman" Magazine from September 1934 to March 1935. Copies of these issues may be read at your local public library, or may be obtained at 25c each from Model Craftsman Publishing Corp., McGraw-Hill Bldg., New York, N.Y.

## Model Locomotive Engine and Tender

The model locomotive engine and tender shown in the illustration below were made by John Matthews of Chicago, Illinois. This model is exceptionally well finished and received a silver medal award at the National Handicraft Exhibition and Contest held at Chicago in 1935 by the National Homework-

shop Guild. This is a  $\frac{3}{4}$ " scale coal burning model and develops sufficient power to pull several adults on flat cars. The machine work required in building this excellent working model was necessarily of the finest precision and was handled in a small back-geared, screw cutting precision lathe.



Fig. 13. A powerful coal burning model locomotive engine and tender, built by John Matthews of Chicago, Illinois.



## Wood Turning on the Lathe

Turning wood on a metal working lathe is a very simple matter. Spur and cup centers are substituted for the 60° centers, a hand rest is attached and the lathe is ready for wood turning.

Special pulleys may be used on the motor and countershaft to provide a series of high spindle speeds for wood turning, in addition to the regular speeds for metal work.

The "Workshop" lathe shown on page 24 is not only a metal and wood working tool but other materials may be machined as well. Alabaster, catalin, bakelite, fibre and other plastics, synthetic resins, etc., may be turned and polished with complete satisfaction.

For examples of wood work turned on a metal working lathe see the illustration below.



Fig. 14. The Illustration shows a Homeshop Enthusiast Turning an Ornamental Wood Column on the Lathe.

Fig. 15. Examples of Wood Working Jobs Done on a 9-inch Swing Metal Working Lathe.





Fig. 16. Some Excellent Examples of Artistic Alabaster Work Turned on a Lathe.

## Turning Alabaster on the Metal Working Lathe

### Beautiful Marble-like Substance That is Easily Machined

While alabaster is found in the United States only in the state of Colorado, this marble-like substance is so beautiful that it is widely used for ornamental work. Alabaster found outside the United States does not have the beautiful tinted shades of that found in Colorado. When freshly quarried, it may easily be turned in the lathe to almost any shape desired.

The delicately tinted shades of alabaster are brought out by finishing it to a smooth surface and polishing. The translucent quality should be taken advantage of by permitting the light to show through whenever the design of the article being made permits. Very beautiful vases and lamps are made with electric lights inside to illuminate them.

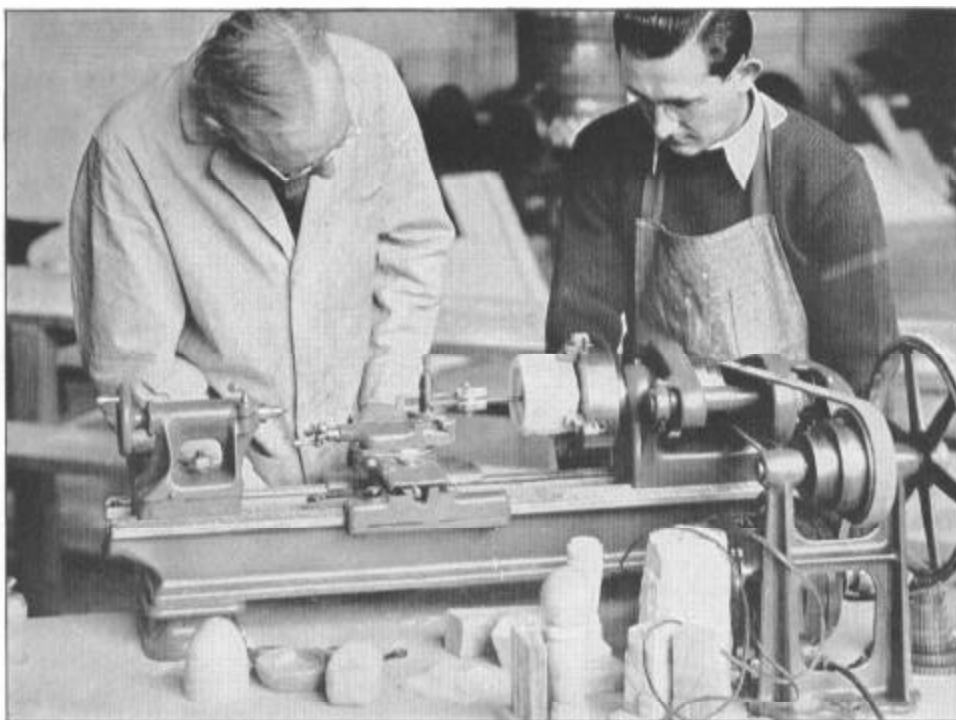


Fig 17. Turning Alabaster on a 9-inch Back-Geared, Screw Cutting Lathe.

## Nested Ash Tray Set

The nested ash tray set shown at the right is attractive and is quite convenient, since it occupies very little space when not in use. No difficult operations are involved, so this is a very good article for the amateur machinist to make.

A number of materials may be used such as bronze, aluminum, fibre, or any of the cast plastic materials, such as bakelite, catalin, etc.

The work should first be mounted in the lathe chuck so that the outside diameter of the flange and the inside of the tray may be finished. The surface should be finished and polished before removing the work from the chuck.

The groove may be filed in or the tray may be mounted on the compound rest top of the lathe and the groove machined with a fly cutter set in a boring bar mounted between the lathe centers.

After completing the inside of the ash tray the work can be reversed and placed in the chuck for finishing the outside. The trays should be machined to the dimensions specified so that they will nest perfectly.

No. PA637. Cast Resin Stock for 10 Trays.....\$2.80

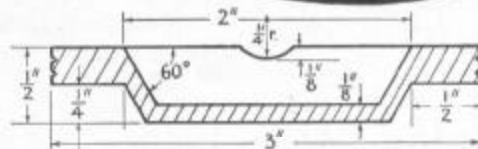
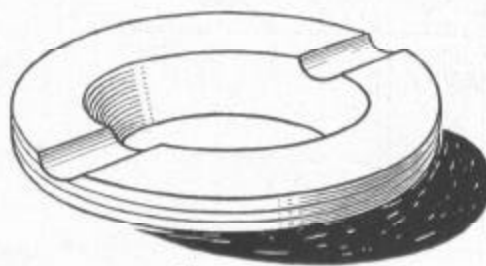


Fig. 18. Drawing Showing Dimensions for Making Ash Tray.

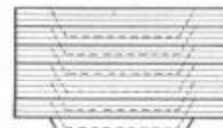


Fig. 19. Nested Ash Tray Set.

## Modernistic Smoking Stand Made of Metal or Cast Plastics

The illustration at the left suggests a modernistic design for a smoking stand which may be made of metal or cast plastics. The design could be varied slightly to suit the taste of the maker.

A combination of metal and cast plastics can be used to produce very attractive and artistic effects. For example, the top and base of the smoking stand could be made of black plastic, finished with a high polish, and the rods made of chromium plated brass or steel. The rods would reflect in the base with a very pleasing and beautiful effect.

Another possibility is to make the entire smoking stand of polished bronze or of any color cast plastic desired.

No. PA643. Complete kit of cast resin plastics in contrasting colors with instructions for Smoking Stand.....\$5.80

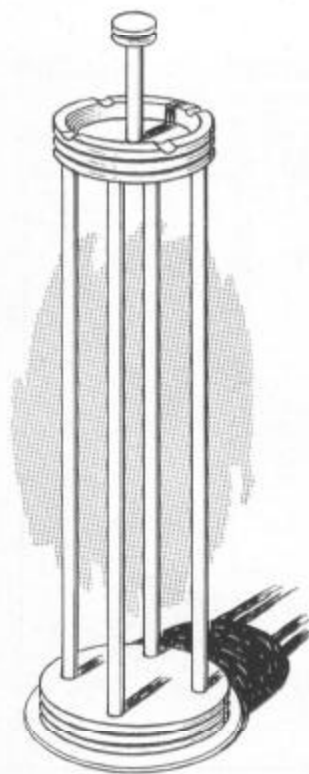


Fig. 20. Design for Modernistic Smoking Stand.

### Cast Resin Plastics

Cast plastics are rapidly becoming a very popular material for household articles, jewelry, ornamental furnishings, etc. There are a number of manufacturers who specialize in supplying cast plastics in small quantities and are equipped to furnish a wide variety of shapes and colors. These cast plastics are easily machined in the lathe and take a beautiful polish. The colors range from white to black, and also in mottled or mixed shades. We shall be glad to supply the names and addresses of several manufacturers on request.



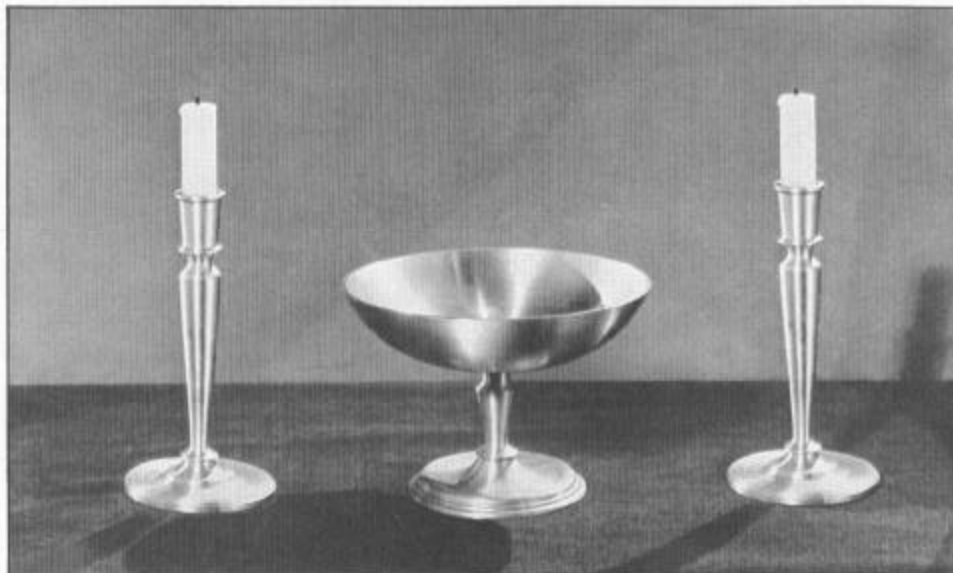


Fig. 23. Bronze Candlestick Set and Bronze Candy Dish Made in the Lathe.

## Bronze Candlesticks and Bronze Candy Dish

A Beautiful Combination Which Adds Luster to Any Room

The bronze candlesticks and bronze candy dish shown in the illustration above make a beautiful set. The dimensions to use for machining these items are shown in the drawings below.

Several types of finish may be used. A very high polish may be obtained by buffing, but a satin finish is just as pleasing. Coarse emery cloth may be used for obtaining the satin finish.

No. RC798C. One set of bronze castings for bronze candy dish. Shipping Weight 5 lbs. Price complete .....\$2.00

No. RC799C. One set of bronze castings for two bronze candlesticks. Shipping Weight 5 lbs. Price complete .....\$2.00

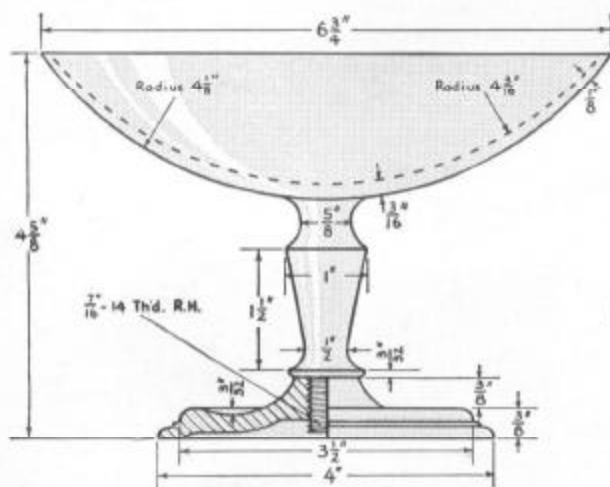


Fig. 24. Detailed Working Drawing of Candy Dish.

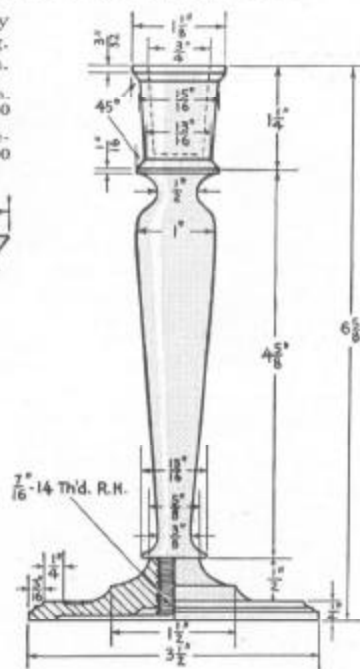


Fig. 25. Detailed Drawing of Candlestick.



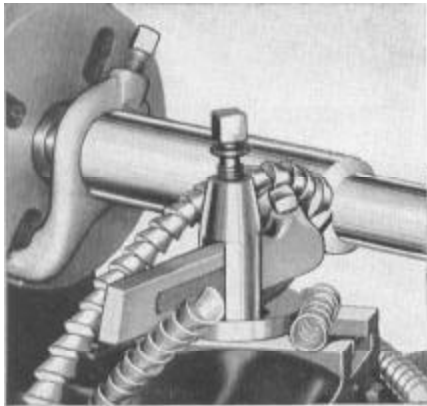


Fig. 26. Taking a Heavy Cut on a Piece of Machinery Steel.



Fig. 27. Boring the Hole in a Steel Bushing.



Fig. 28. Sharpening a Reamer with Grinding Attachment.



Fig. 29. Cutting-off or Parting Tool in Operation.



Fig. 30 At Left—Using Internal Micrometer to Measure Hole.

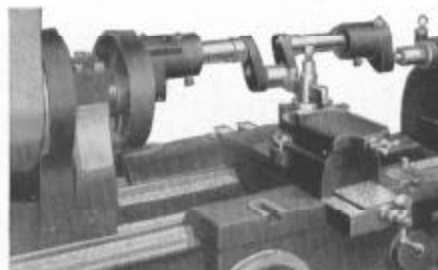


Fig. 38. Machining a Crankshaft Held Between Centers in the Lathe.

## A Few Examples of

All These Operations Can Be Done On a 9-inch W



Fig. 31. Cutting a Screw Thread on a Bushing.



Fig. 34. Knurling a Shaft Between Lathe Centers.



Fig. 32. Squaring End of Shaft in Milling Attachment.



Fig. 33. Cutting-off Work Held in a Collet Chuck.

## The Most Common

- |                          |     |
|--------------------------|-----|
| Turning                  | Pip |
| Cutting-off              | Pa  |
| Boring                   | Ac  |
| Screw Thread Cutting     | Te  |
| Knurling                 | Me  |
| Machining Bevels         | Me  |
| Spring Winding           | Te  |
| Drilling                 | Co  |
| Reaming                  | Ta  |
| Chucking                 | Ch  |
| Metal Spinning           | Re  |
| Facing                   | Us  |
| Taper Boring and Turning | For |
| Sanding and Polishing    | Cu  |
| Grinding                 | Dr  |
| Filing                   | Tu  |
| Turning Irregular Work   | Cro |



Fig. 39. Cutting a Gear on a Lathe.

# s of Machine Work

inch Workshop Back-Geared, Screw Cutting Lathe

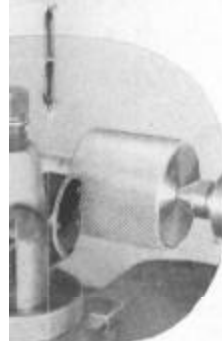


Fig. 34. Curling a Steel Piece on Lathe Centers.

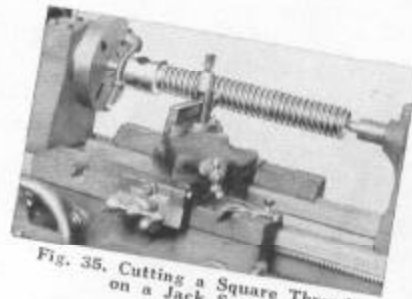


Fig. 35. Cutting a Square Thread on a Jack Screw.

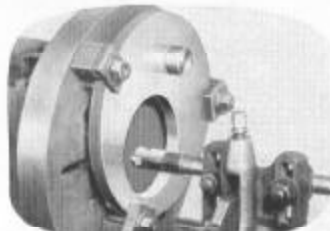


Fig. 36. Boring an Eccentric on Lathe Face Plate.

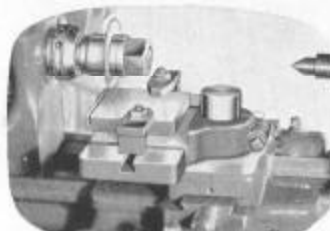


Fig. 37. Milling a Slot with Milling and Boring Table.

Fig. 45. At Right—Milling a Dovetail in Milling Attachment.

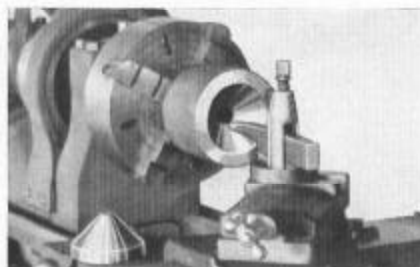


Fig. 40. Boring an Inside Taper Hole Using Compound Rest of Lathe.

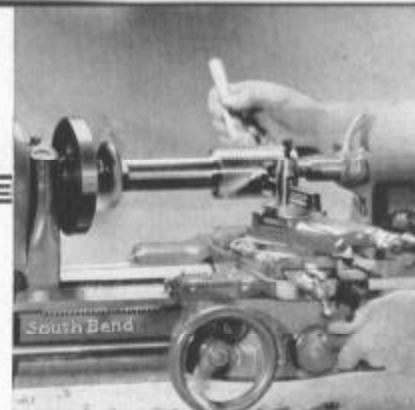


Fig. 41. Cutting a Large Screw Thread on a Shaft.



Fig. 42. Lapping and Polishing Attachment for Lathe.



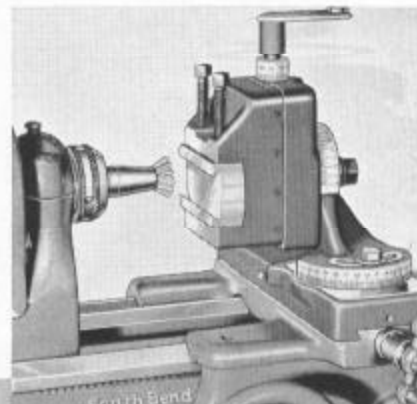
Fig. 43. Winding Experimental Radio Coils in the Lathe.



Fig. 44. Winding a Spring on an Arbor in the Lathe.



Fig. 39. Cutting Small Gears with Cutting Attachment.



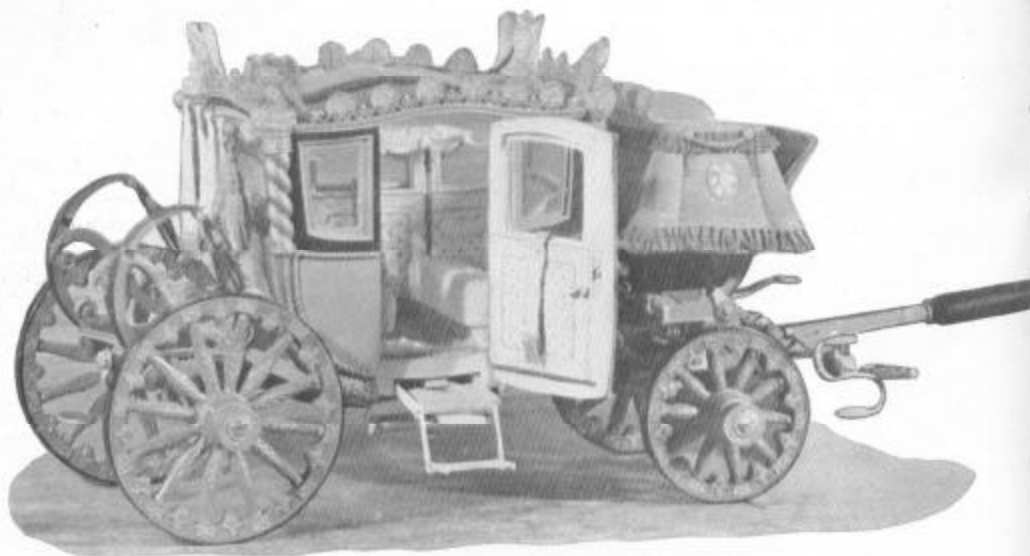


Fig. 46. Prize Winning Napoleonic Model Coach Made by Franklin Atwater.

## Napoleonic Model Coach

Each year the Fisher Body Company, at Detroit, Michigan, sponsors a Model Coach Contest, and in 1934 Franklin Atwater, of New Britain, Connecticut, was awarded first prize for the coach shown above. Mr. Atwater built this coach with the aid of a 9-inch swing lathe, and the national first award which he received entitled him to \$5000.00 in cash or a four-year expense paid course at college. He chose the latter.

Complete instructions outlining every detail in the construction of the coach can be obtained from the Fisher Body Company, Detroit, Michigan, and if you are interested in obtaining information regarding this Model Coach Contest, we suggest that you get in touch with the local distributor of General Motors automobiles. In addition to the national awards, there are many state and district awards that are well worth competing for.



Fig. 47. "Sovereign of Seas"—34" long, 26" high.

## "Sovereign of Seas" Model Ship

The original of this model ship was the most beautiful English warship ever launched, and was the first ship to mount 100 guns. The ship is of the period of 1637.

In order to produce an authentic model the guns should be made of brass or iron and turned and polished in the lathe. The lathe will also be found useful in making other parts of model ships, such as pulley blocks, pilot wheels, ornaments, etc.

This is a museum type model 34" long and 26" high over all. Plans give full size lift templates and details of rigging, ornaments, masts, etc.

### Blueprints and Text Book

No. PM828. Set of eight blueprints .....	\$1.50
No. PM736. Complete descriptive text in bound book on the "Sovereign of the Seas" ship model.	
Price .....	\$1.00

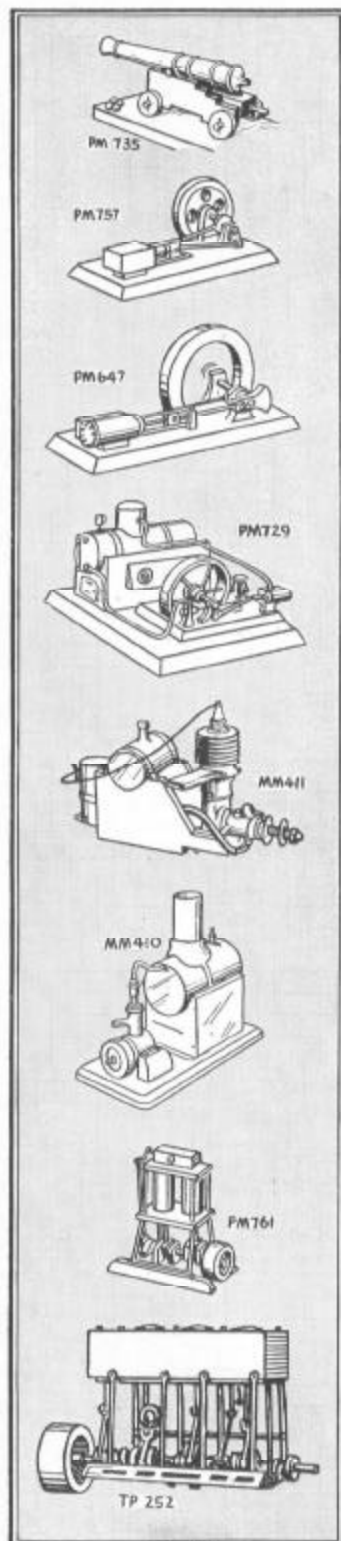


Fig. 48

## Excellent Working Models For The Beginner

Listed below are a number of excellent working models for the beginner, ranging from very simple models to those requiring considerable skill in modelmaking. No castings or supplies are available for some of these models but they may be constructed entirely of steel and brass. Many modelmakers make their own castings of babbitt metal, lead or type metal, and suggestions for doing this will be found in the blueprints of some of the models.

### Model Colonial Cannon No. PM735

This is a perfect 10" miniature of an American naval gun used about 1776. The barrel is made of turned brass and the mounting constructed of wood. The design of the barrel is very attractive, and if well finished this model will make a beautiful mantelpiece.

No. PM735. One Blueprint Model Colonial Cannon.....\$0.25

### Simplified Steam Engine Model No. PM757

This one-cylinder horizontal type steam engine is an excellent model for the beginner. It has a 4" flywheel which may be cast from die metal, lead, babbitt or type metal.

No. PM757. Set of two Blueprints of Simplified Steam Engine .....\$0.50

### Model Horizontal Steam Engine No. PM647

This engine has a 1" bore and 1 1/4" stroke. The flywheel is 6" in diameter. This is a good project for the amateur machinist. No castings are required.

No. PM647. One Blueprint Horizontal Steam Engine.....\$0.25

### Horizontal Steam Engine and Boiler No. PM729

This model horizontal steam engine and boiler develops 1/30th H.P. at 15 lbs. pressure. The flywheel is 5 3/4" in diameter and the cylinder has 3/8" bore and 3/8" stroke.

No. PM729. Set of six Blueprints of Horizontal Steam Engine and Boiler .....\$1.00

### Miniature Air-Cooled Gasoline Engine No. MM411

This is a two-cycle gasoline engine suitable for operating a 4 ft. airplane or small motor boat. Cylinder bore, 1 1/8 inch; stroke, 3/4 inch; weight complete 12 oz.

No. MM411. One Blueprint of a Miniature Air-cooled Gasoline Engine. Price .....\$1.00

### Single Cylinder Model Steam Engine No. MM410

This engine is suitable for operating model boats. Has 1/2 inch bore, 3/4 inch stroke; has a tubular type boiler; no castings are required.

No. MM410. One Blueprint of Single Cylinder Model Steam Engine. Price .....\$1.50

### Twin Cylinder Marine Engine No. PM761

This model is of an upright steam operated marine engine with two cylinders. The flywheel is 1 1/4" in diameter, and the cylinders have 17/32" bore. No castings are required. This is an excellent engine for operating a 30" model boat.

No. PM761. One Blueprint Twin Cylinder Marine Engine \$0.25

### Vertical Marine Engine Models

No. TP250. Single cylinder Marine Engine, 3/4" bore, 3/4" stroke. Castings, blueprint and sundries .....\$4.50

No. TP251. Twin cylinder single expansion Marine Engine, 1" bore, 3/8" stroke. Castings and blueprint .....\$9.00

No. TP252. Triple expansion Marine Engine, 3/8", 1 1/4" and 1 1/4" bore by 1" stroke. Castings and blueprint .....\$27.00

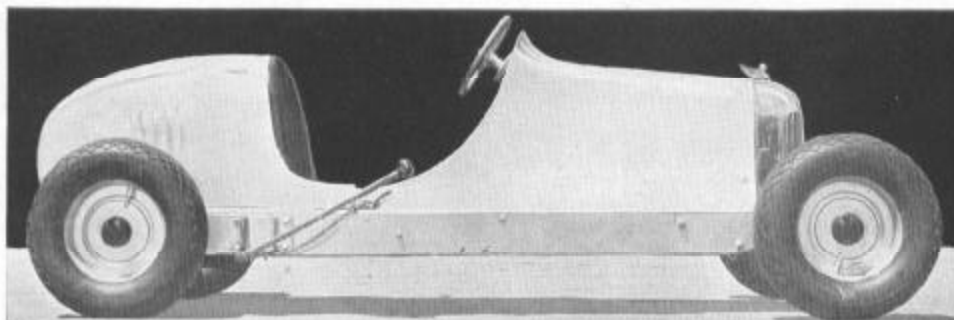


Fig. 49. Miniature Auto Driven by Small Gasoline Engine Mounted Under Rear Hood.

## Scale Model of Famous Racing Car

### Miniature Auto Driven by Small Gasoline Engine

This is a miniature copy of famous Miller Dirt Track Racer and has class, beauty and speed; yet may easily be made in the shop equipped with a lathe. Any small outboard motor or washing machine engine can be used.

The car is equipped with a clutch and has forward and reverse speeds so that the car can start, stop and reverse and halt properly at traffic signals.



Fig. 50. Front View of Miniature Automobile.

No. MW604B. One blueprint (size 19" x 66") showing the complete design and construction of this model. Price Postpaid.....\$3.00

## Cast Plastic Cigarette Box

### May be Used as Jewel Box



Fig. 51. Cigarette Box made of Cast Plastic—Both Useful and Ornamental.

Fig. 51 at the left shows an excellent design for a cigarette box or jewel box which may be made of cast plastic material. The various parts should first be machined to the dimensions shown below, and then assembled.

Cast plastics are finished by machining in the lathe, then sanded to remove the tool marks and polished in the lathe.

No. PA779. Complete kit containing rough stock for making all parts of cigarette box shown in Fig. 51. Price.....\$1.75

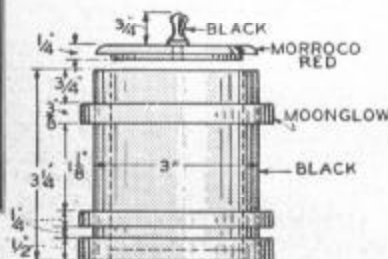


Fig. 52. The drawing at left shows the principal dimensions for Machining the Cast Plastic Cigarette Box.



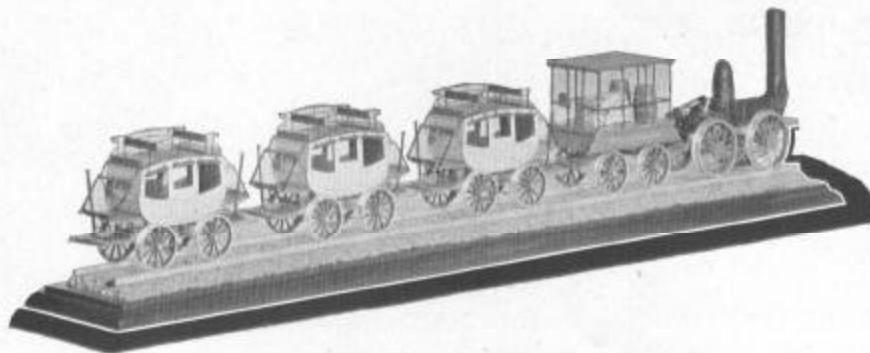


Fig. 53. The Famous DeWitt-Clinton Model Train.

## De-Witt-Clinton Model Train

This  $\frac{1}{8}$ " scale model of the famous DeWitt-Clinton engine, tender, coaches and road bed was used for the Popular Mechanics \$2500.00 Prize Contest. The base measures 6" x 36".

The model of this most notable early American train is constructed of wood and metal parts, all of which can be machined in a 9-inch swing back-geared, screw cutting lathe.

### Blueprints and Instructions

No. PM800. Set of 10 blueprints of the De-Witt-Clinton Model Train.....\$2.00.

The making of this model was explained in detail in Popular Mechanics Magazine, pub-

lished January to May of 1932. Copies are available at 25c each and may be ordered from Popular Mechanics Magazine, 200 East Ontario Street, Chicago, Illinois.

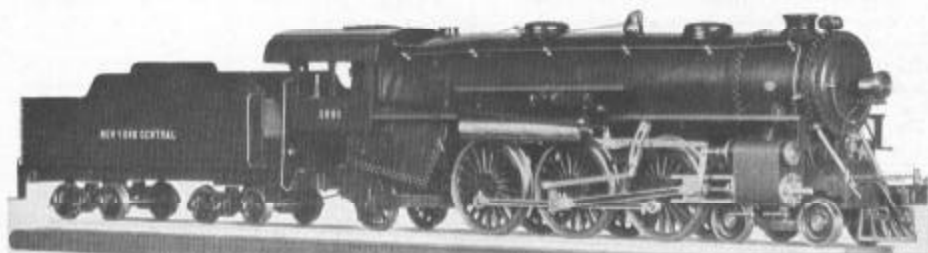


Fig. 54.  $\frac{1}{2}$ " Scale,  $2\frac{1}{2}$ " Gage Alcohol Burning Model Steam Locomotive.

## Pacific Model Locomotive

Scale  $\frac{1}{2}$ " = 1',  $2\frac{1}{2}$ " Gage, Alcohol Burner

This  $\frac{1}{2}$ " scale Pacific Model Locomotive is a model that anyone might be proud of, yet it is not too difficult to be attempted by any modelmaker with some experience in the use of a back-geared, screw cutting metal working lathe. Complete in every detail, this model will actually operate under its own power and pull a surprising load. The cylinders have

$\frac{9}{16}$ " bore x  $1\frac{1}{8}$ " stroke. Boiler has water tubes and burns alcohol.

### Blueprints and Castings

No. TP693B.	Blueprints only.....	\$6.00
No. TP693BC.	Complete set of castings and blueprints.....	\$38.00

## $\frac{1}{4}$ " and $\frac{3}{4}$ " Scale Steam Locomotives

### $\frac{1}{4}$ " scale, $1\frac{1}{4}$ " Gage Steam Locomotives

Cylinders:  $\frac{3}{16}$ " bore x  $\frac{3}{4}$ " stroke alcohol burner.  
No. TP697BC. Complete set of castings and blueprints.....\$11.00  
No. TP697B. Blueprints only.....3.00

### $\frac{3}{4}$ " scale, $3\frac{1}{2}$ " Gage Steam Locomotives

Cylinders:  $1\frac{1}{4}$ " bore x  $1\frac{1}{4}$ " stroke, coal burner  
No. TP700BC. Complete set of castings and blueprints.....\$72.00  
No. TP700B. Blueprints only.....9.00



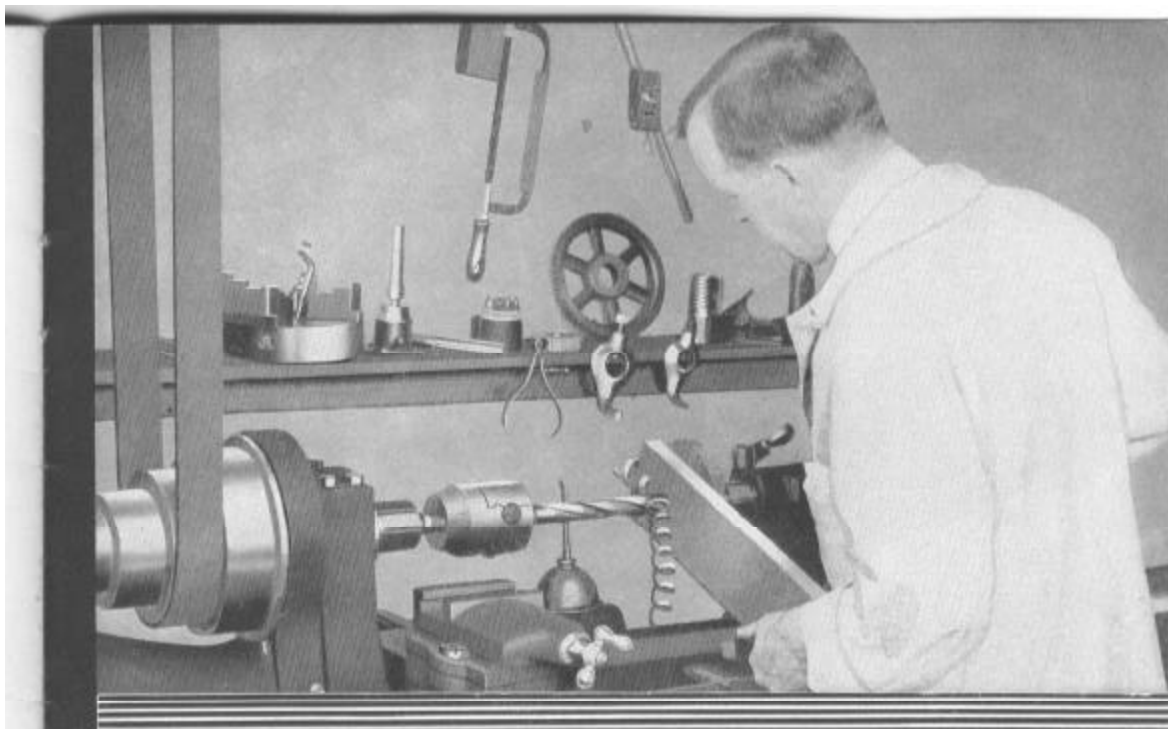


Fig. 57. Drilling a Flat Piece of Steel in the Lathe.

## Drilling Metal in the Lathe

The illustrations on this page show a few drilling operations that can be done in the lathe. The machinist uses the lathe for drilling jobs of all kinds. The lathe has the power and speeds, as well as the automatic feeds, for handling hundreds of drilling operations and for doing a great variety of reaming and boring.



Fig. 58.  
Above—Drilling a bushing held in universal chuck.

Fig. 60.  
Below—Facing and drilling a gear blank held in a chuck.



Lathe chucks can be fitted to the headstock spindle for holding the work to be drilled and drill chucks can be fitted to either the headstock or the tailstock of the lathe for drilling, reaming and boring.

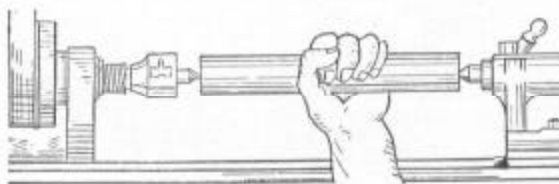


Fig. 59.  
Above — Drilling a center hole in the end of a shaft using a combination center drill and countersink held in a drill chuck in the headstock.

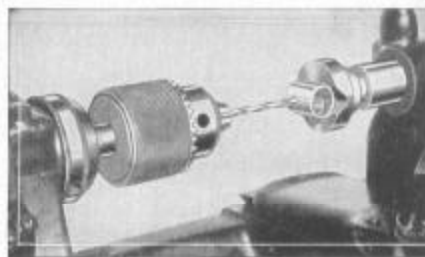


Fig. 61.  
Above—Drilling an oil hole. Work is held in crotch center.

Fig. 62.  
Below—Drilling a center hole in the end of a shaft.



## Prices of South Bend Machine Shop Projects

The tabulation below shows the complete list of South Bend Machine Shop Course Projects. You may order individual projects complete or in part to meet your own shop requirements.

The prices of mimeograph drawings and job sheets include postage to any point in the world. Prices for rough castings, steel and hardware are f.o.b. South Bend, Ind.

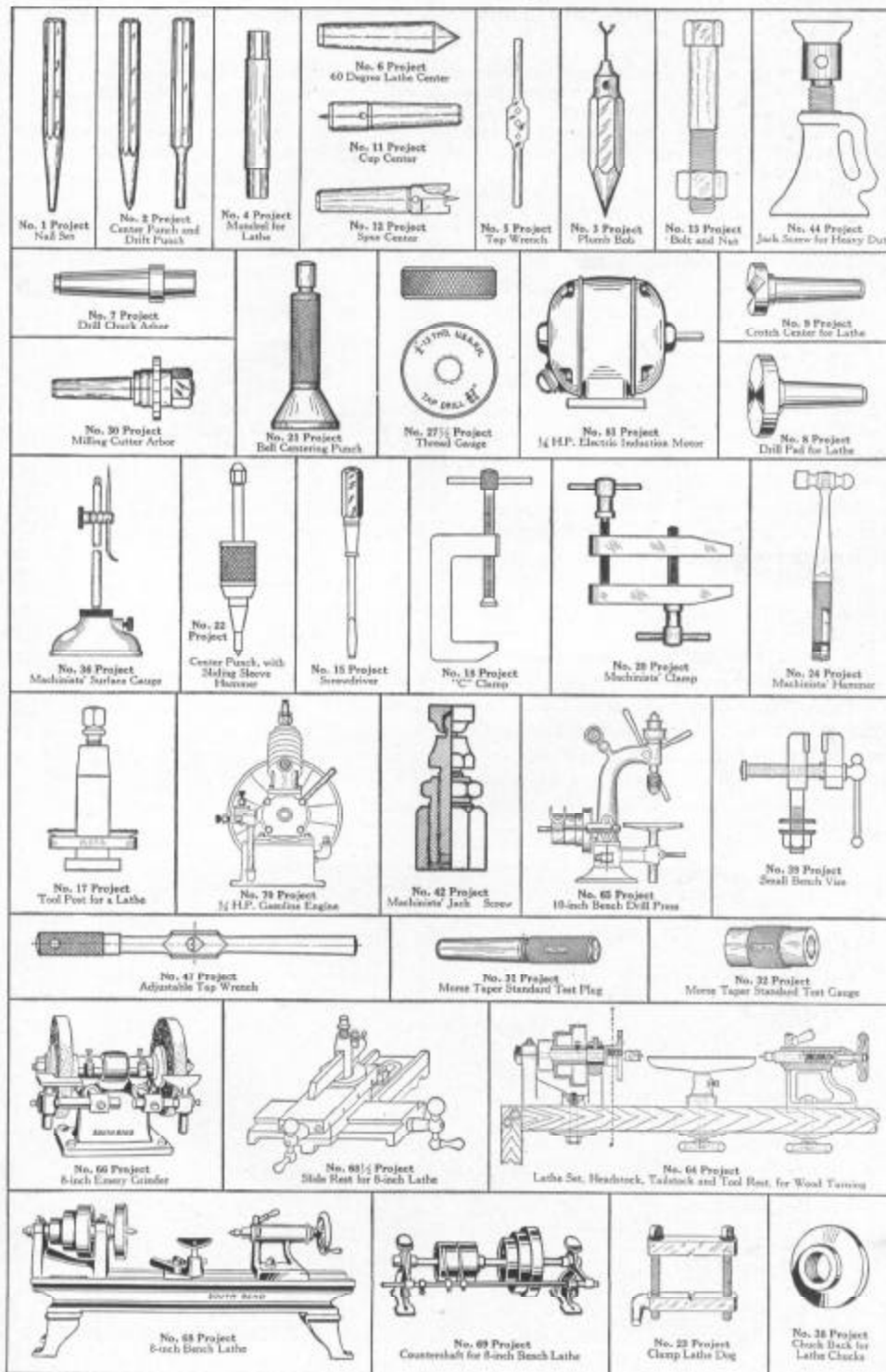
### 56 Practical Machine Shop Projects for the Student and Apprentice

Project Number	Name of Project	No. of Drawings	No. of Job Sheets	Approx. Weight of Finished Projects	PRICES		
					Drawings and Job Sheets Postpaid	Rough Castings F. O. B. South Bend	Steel and Hardware F. O. B. South Bend
1	Nail Set	1	2	$\frac{1}{4}$ lb.	\$0.20		\$0.05
2	Center Punch and Drift Punch	1	2	$\frac{1}{2}$ lb.	.20		.10
3	Plumb Bob	1	2	1 lb.	.20		.10
4	Steel Mandrel, or Arbor, for Lathe	1	3	2 lbs.	.25		.30
5	Tap Wrench, for $\frac{3}{8}$ -in., $\frac{1}{2}$ -in. and $\frac{3}{4}$ -in. Taps	1	2	2 lbs.	.20		.25
6	60° Lathe Centers, Head and Tail	1	2	2 $\frac{1}{2}$ lbs.	.20		.75
7	Drill Chuck Arbor	1	2	2 lbs.	.20		.25
8	Drill Pad for Lathe	1	2	3 lbs.	.20	\$0.40	
9	Crotch Center for Lathes	1	2	2 $\frac{1}{2}$ lbs.	.20	.35	
10	Blacksmith's Drill Chuck	1	3	2 $\frac{1}{2}$ lbs.	.25	.40	
11	Cup Center, for Wood Turning	1	4	1 $\frac{1}{2}$ lbs.	.30		.25
12	Spur Center, for Wood Turning	1	3	1 $\frac{1}{2}$ lbs.	.25		.25
13	1-in. Bolt and Nut	1	4	5 lbs.	.30		.50
14	Pipe Center and Shank	1	5	10 lbs.	.35	1.00	1.10
15	Screwdriver, Steel	1	4	1 lb.	.30		.15
17	Tool Post for a Lathe	1	8	6 lbs.	.50		.75
18	"C" Clamp	1	6	2 lbs.	.40		.30
20	Machinist's Clamp	1	4	1 $\frac{1}{2}$ lbs.	.30		.30
21	Bell Centering Punch	1	4	2 lbs.	.30	.25	.10
22	Center Punch, with Sliding Sleeve Hammer	1	5	2 lbs.	.35		.30
23	Clamp Lathe Dog	1	5	3 lbs.	.35		.60
24	Machinist Hammer Kit	1	4	7 lbs.	.60		1.20
26	Taper Mandrel with Expansion Sleeve	1	6	20 lbs.	.40		3.00
27	Cast-Iron Pulley	1	2	12 lbs.	.20	1.75	
27 $\frac{1}{2}$	Thread Gauge	1	2	$\frac{1}{2}$ lb.	.10		.15
29	Boring Bars for the Lathe	1	3	8 lbs.	.25	.50	.75
30	Milling Cutter Arbor for Milling in Lathe	1	5	5 lbs.	.35		.75
31	Morse Taper Standard Test Plug	1	4	2 lbs.	.20		.25
32	Morse Taper Standard Test Gauge	1	4	2 lbs.	.25		.40
36	Machinist's Surface Gauge	1	9	5 lbs.	.55	.40	.40
38	Chuck Back for Lathe Chucks	1	2	10 lbs.	.20	1.50	
39	Small Bench Vice, 2 $\frac{1}{2}$ -in. Jaws	1	9	18 lbs.	.55		2.00
41	Mercury Plumb Bob	1	3	1 lb.	.25		.15
42	Machinist Jack Screw	1	4	1 $\frac{1}{2}$ lbs.	.30		.25
44	Jack Screw for Heavy Duty	1	2	21 lbs.	.20	1.75	1.40
46	Cabinetmaker's Vice	1	6	25 lbs.	.40	2.00	1.50
47	Adjustable Tap Wrench	1	4	1 $\frac{1}{2}$ lbs.	.30		.40
48	Tap Wrench	1	3	2 lbs.	.25		.30
54	Polishing Head for Bench	3	7	30 lbs.	.65	3.00	1.15
55	6-inch Improved Water Motor	3	6	12 lbs.	.60	1.85	.15
58	Arbor Press	3	5	115 lbs.	.55	15.00	1.00
61 $\frac{1}{2}$	Surface Plate	1	1	110 lbs.	.10	16.00	
62	Hand Power Emery Grinder	6	10	22 lbs.	1.10	2.10	.75
64	Lathe Set, Head Stock, Tail Stock, and Tool Rest for Wood Turning	5	10	58 lbs.	1.00	7.00	1.40
64 $\frac{1}{2}$	Countershaft for Lathe Set	3	3	43 lbs.	.50	5.50	1.00
65	10-inch Bench Drill Press	6	15	88 lbs.	1.35	18.00*	
66	8-inch Emery Grinder	5	4	50 lbs.	.70	6.75	1.00
66 $\frac{1}{2}$	Floor Column, Pan & Waterpot for 8" Grinder	7	2	80 lbs.	.35	12.00	.15
67	Countershaft for 8-inch Emery Grinder	4	4	45 lbs.	.60	5.50	1.00
68	8-inch Bench Lathe	11	17	120 lbs.	1.95	16.50	3.00
68 $\frac{1}{2}$	Slide Rest for 8-inch Bench Lathe	4	8	16 lbs.	.80	2.10	.50
69	Countershaft for 8-inch Bench Lathe	3	4	43 lbs.	.50	5.75	1.00
70	$\frac{1}{4}$ H. P. Gasoline Engine, Vertical, Air Cooled	9	15	35 lbs.	1.65	8.00*	
71	$\frac{1}{4}$ H. P. Gasoline Engine, Horizontal	6	1	20 lbs.	.60	20.00*	
80	Model Airplane Engine $\frac{1}{2}$ H. P.	1	1	1 $\frac{1}{2}$ lbs.	2.00	8.00*	
81	Electric Motor— $\frac{1}{4}$ H. P.	Complete Information and Prices on Request.					

\*Prices include both Castings and Steel Parts. Prices of Engines do not include ignition coils or spark plugs

†Cannot furnish.

## South Bend Machine Shop Course Projects





# Blueprints and Instruction Sheets for Projects

For Machining Projects Illustrated and Described in this Booklet

Blue prints and job instruction sheets similar to those illustrated and described below can be supplied for most of the projects illustrated and described throughout this booklet. The number and size of the blue prints and the number of the instruction sheets vary according to the importance of the project, and sufficient information is provided to enable the mechanic to proceed with the work from start to finish.

Blueprints for all of the projects listed on pages 20 and 21 are uniform in size, being 12" x 18". The job instruction sheets supplied for these projects are also uniform in size and measure 8½" x 14".

The sample blueprint and instruction sheet reproduced on this page are to aid the mechanic in machining Project No. 13, "1-inch Bolt and Nut," which is illustrated and listed on pages 20 and 21. Detailed dimensions are given in the drawing and the instruction sheet outlines in sequence the various operations required for machining the project.

## Reference Book

The book, "How to Run a Lathe," is used as a text on all the projects illustrated and described on pages 20 and 21. This book, together with the other books listed on the back cover of this bulletin, will be of great assistance to the mechanic in doing the required machine work on the various projects.

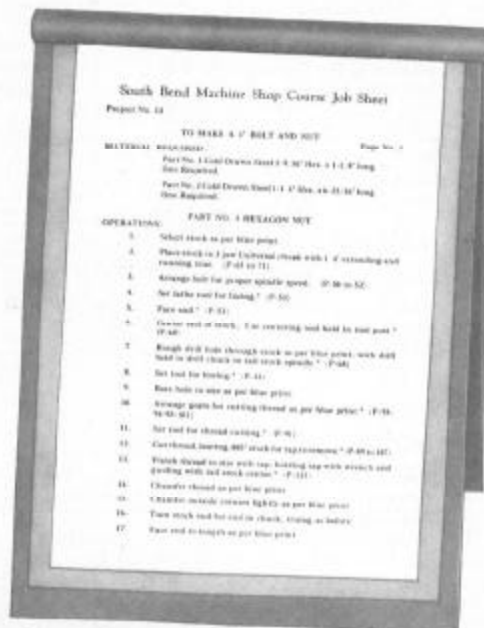


Fig. 63. Instruction Sheet for Project No. 13.

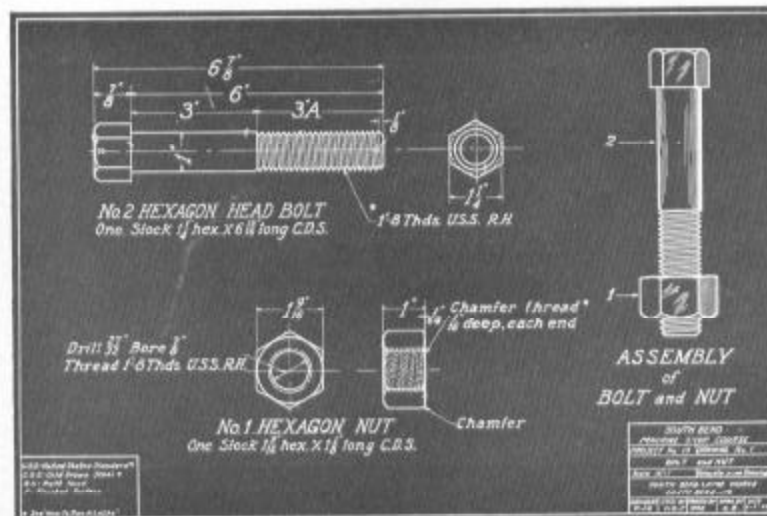


Fig. 64. Blueprint (Actual Size 12" x 18") for Project No. 13, "1-inch Bolt and Nut".

## Supplies and Plans of Projects and Models

Frequently our customers write to us for sources of blue prints and plans of metal and wood projects, or for articles that can be machined in South Bend Lathes. For your convenience, we have compiled the following list of suppliers. You can obtain complete information and prices on these projects, plans, blue prints, and materials by writing direct to the addresses given below.

### Project Blue Prints and Job Plans

Popular Mechanics Magazine, 200 E. Ontario St., Chicago, Ill. .... List of Blue Prints  
 Popular Science Monthly, 353 Fourth Ave., New York City .... List of Blue Prints  
 Popular Homecraft Magazine, 737 N. Michigan Ave., Chicago, Ill. .... Book of Plans  
 Modern Mechanix Publ. Co., 529 S. 7th St., Minneapolis, Minn. .... List of Blue Prints  
 The Home Craftsman, 63 Park Row, New York City .... List of Blue Prints  
 The Model Craftsman, 330 West 42nd St., New York City .... List of Plans  
 South Bend Lathe Works, 425 E. Madison St., South Bend, Ind. .... Book of Projects and Plans

### Home Shop and Modelmaking Supplies

Pierce Model Works, Tinley Park, Ill. .... Gears and Metal Stock  
 Craftsman Wood Service Co., 2720 Mary St., Chicago, Ill. .... Special Hdw., Lumber, Plans, Etc.  
 Structural Model Works, 64 W. 23rd St., New York City .... Structural Parts  
 Fanwood Specialties Co., Fanwood, N. J. .... Catalin, Carving Tools and Cutters  
 W. F. Andersen, P. O. Box 142, Alameda, Calif. .... Foundry Equipments  
 Cleveland Model & Supply Co., Inc., 1858 W. 57th St., Cleveland, Ohio. .... Lumber, Plastics, Parts

### Model Airplane Equipment

International Models Co., 1775 Broadway, New York City .... Construction Kits  
 Cleveland Model & Supply Co., Inc., 1858 W. 57th St., Cleveland, Ohio. .... Kits and Supplies  
 Hawk Model Aeroplanes, 4944 Irving Park Blvd., Chicago, Ill. .... Blue Prints, Supplies  
 John T. Fergusson, P. O. Box 118, South Bend, Ind. .... Kits, Supplies, Engines

### Model Railroad Equipment

Chas. A. Cole, 1355 Church St., Ventura, Calif. .... O Gauge Construction Parts  
 W. K. Walther, 1560 W. Pierce St., Milwaukee, Wis. .... Track Signals, Cars, Control Supplies  
 H. B. Fisher, 169 Joralemon St., Belleville, N. J. .... 1/2" Scale Locomotive Parts  
 Nason Railways, P. O. Box 6, New Rochelle, N. Y. .... OO Gauge Equipments  
 G. D. Stock, 40 W. Mt. Airy Ave., Philadelphia, Pa. .... HO Gauge Parts  
 T. Pong Co., 712 E. Washington St., Ann Arbor, Mich. .... Electric and Steam Locomotives  
 Hawk Model Aeroplanes, 4944 Irving Park Blvd., Chicago, Ill. .... Kits, 1/4" Scale Car Parts

### Model Steam and Gasoline Engines

Howard Engine & Mfg. Co., 2417 N. Ashland Ave., Chicago, Ill. .... Engine Castings  
 Wall's Model Engine Laboratory, 5900 N. Fairfield, Chicago, Ill. .... Construction Sets and Castings  
 Alfred Paul & Son, 3 Ashland St., Melrose, Mass. .... Boilers and Engines  
 Forster Bros., 706 Keystone Ave., River Forest, Ill. .... Castings and Engines  
 John T. Fergusson, P. O. Box 118, South Bend, Ind. .... Model Engines  
 Loutrel Specialty Co., 1011 Wyckoff Ave., Brooklyn, N. Y. .... Castings and Engines

### Amateur Telescope Supplies

John M. Pierce, 11 Harvard St., Springfield, Vt. .... Kits, Glass Discs, Prisms  
 Precision Optical Supply Co., 991 E. 163d St., New York City .... Kits, Glass, Pitch, Etc.  
 Tinsley Telescope & Inst. Co., 3017 Wheeler St., Berkeley, Cal. .... Kits, Fittings, Etc.  
 C. C. Young, 517 S. Main St., East Hartford, Conn. .... Telescope Mountings

### Steel and Brass Stock

Central Steel & Wire Co., 4545 S. Western Ave., Chicago, Ill. .... Sheets and Rods  
 National Steel Co., 1319 Kingsbury St., Chicago, Ill. .... Sheets and Rods  
 Steel Sales, 129 S. Jefferson St., Chicago, Ill. .... Sheets, Rods and Tubes

### Gears, Racks, Screws, Etc.

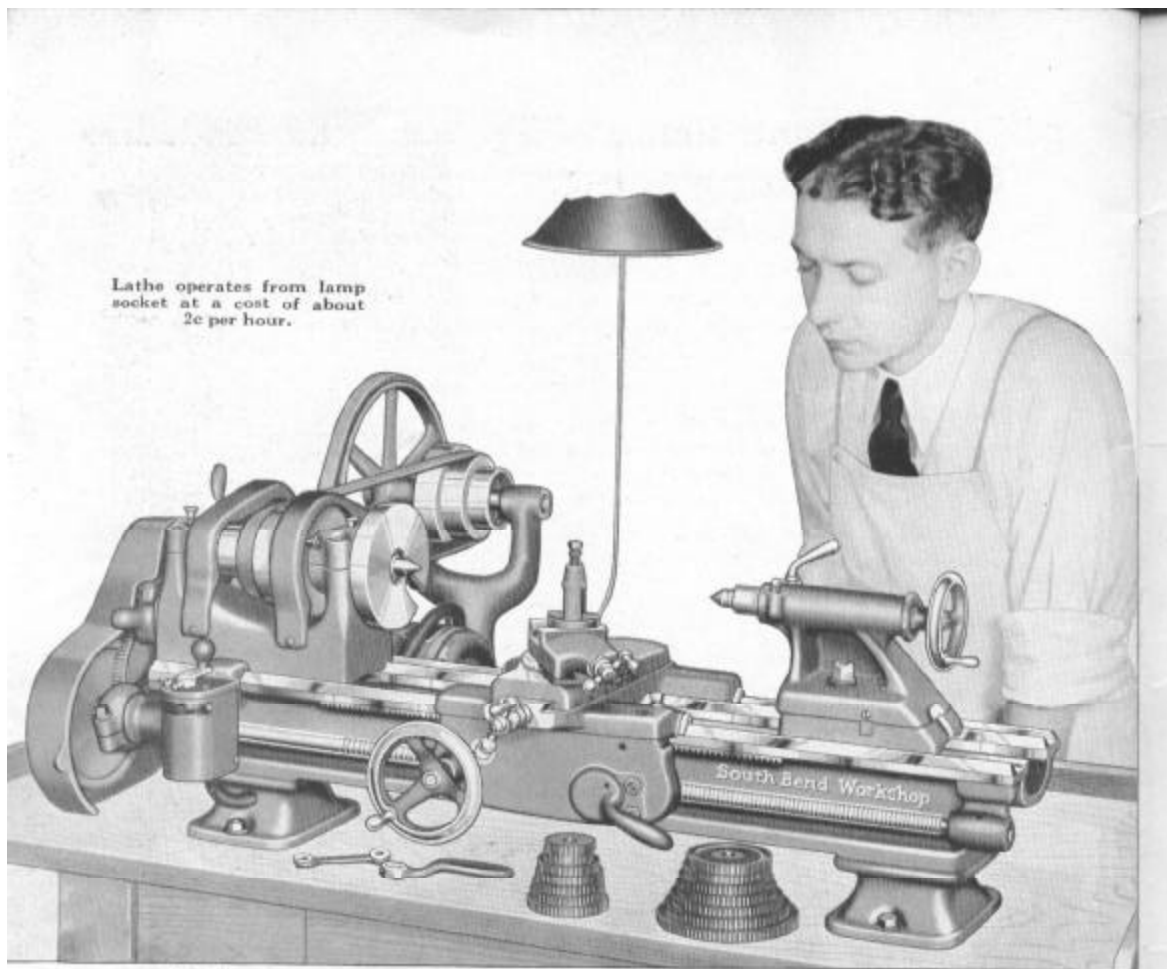
Boston Gear Works, North Quincy, Mass. .... Gears and Racks  
 Foote Bros. Gear & Machine Co., 5304 S. Western Ave., Chicago, Ill. .... Gears and Racks

### Screws, Bolts, Nuts, Etc.

H. Channon Co., N. Wacker Drive & Randolph St., Chicago, Ill. .... General Hardware  
 Charles Products Co., 327 W. Madison St., Chicago, Ill. .... General Hardware

### Model Ship and Boat Supplies

A. J. Fisher, 1002 Etowah Ave., Royal Oak, Mich. .... Plans and Fittings  
 Gene's, 510 E. 11th St., New York City .... Plans and Fittings  
 Boucher Playthings Mfg. Corp., 126 Lafayette St., New York City .... Plans and Fittings  
 Horace D. Sheldon, 323 Belleville Ave., Bloomfield, N. J. .... Models and Fittings



Lathe operates from lamp socket at a cost of about 2c per hour.

Fig. 65. 9" x 3' "Workshop" South Bend Precision Bench Lathe, with Horizontal Motor Drive and Regular Lathe Equipment

## 9-inch "Workshop" South Bend Bench Lathe

### A Back-Geared, Screw Cutting Metal Working Precision Lathe

*Practical for the Home Workshop*

The 1936 Model 9-inch "Workshop" South Bend Lathe is the ideal tool for the home workshop, the laboratory, and any shop desiring an accurate, sturdy, modern back-geared, screw cutting precision lathe.

The "Workshop" Lathe is supplied in bench and floor leg models in both flat belt and V-belt types. The drives furnished include: counter-shaft drive, horizontal motor drive, and underneath motor drive. Any model can be supplied in bed lengths of 2½, 3, 3½, 4, and 4½ feet.

Standard screw threads from 4 to 40 per inch, right or left hand, including 11½ and 27

pipe threads can be cut in this lathe. We recommend it for making the finest precision gauges, taps, tools and dies.

Hundreds of machining operations on metals, woods and compositions such as turning, threading, boring, facing, drilling, etc., can be done on this lathe. Special work such as milling, grinding, etc., can also be handled when the lathe is equipped with attachments of which there are thirty-eight in the complete line.

Descriptions, illustrations, and prices of the "Workshop" Lathe will be found in Catalog No. 15-T described on the following page.

#### "Workshop" Lathe Features

Back-geared headstock, six spindle speeds  
Twin gear reverse for threads and feeds  
Compound rest graduated 180°  
Tailstock has ½" set-over for taper turning  
Micrometer graduations on feed screws  
Automatic longitudinal power feeds to carriage  
Precision lead screw for screw thread cutting  
Three V-ways and one flat-way on lathe bed

#### "Workshop" Lathe Specifications

Swing over bed	9 1/4"
Swing over carriage	5 1/2"
Collet Capacity	1/8" up to 1/2"
Hole Through Spindle	3/4"
Screw thread cutting range	4 to 40 per in.
Spindle Speeds	39, 68, 122, 202, 353, 630, R.P.M.
Head and tail spindle centers	No. 2 Morse Taper
Size of motor used	1/4 H.P.

Write for No. 15-T "Workshop" Catalog Describing the Above Lathe.

## 9-inch "Workshop" Lathe Catalog No. 15-T

A VALUABLE 32 PAGE BOOK

Complete information on the 9-inch "Workshop" Lathe will be found in this 32-page  $8\frac{1}{2} \times 11$ " Catalog No. 15-T. It contains over 150 illustrations, also complete description and prices of all 9-inch "Workshop" Lathes and attachments.

The "Workshop" Lathe is made in several bed lengths ranging from  $2\frac{1}{4}'$  to  $4\frac{1}{2}'$  and providing from 11" to 35" between centers. Several types of motor drive can be supplied, as well as countershaft drive.

If you are interested in lathe work, write for this Catalog No. 15-T. Postpaid, to any address.

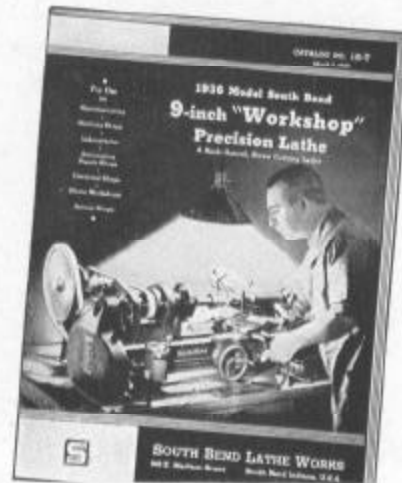


Fig. 66.

## South Bend Back-Geared, Screw Cutting Lathes

Made in 9-inch, 11-inch, 13-inch,  $14\frac{1}{2}$ -inch, and 16-inch Swing

South Bend Back-Geared, Screw Cutting Precision Lathes have been on the market for thirty years. Thousands of these lathes are in use in the U. S. A. and 96 other countries throughout the world in industry, manufacturing plants and tool rooms.

South Bend Lathes are made in 9-inch, 11-inch, 13-inch,  $14\frac{1}{2}$ -inch, and 16-inch swing sizes and in bed lengths from  $2\frac{1}{2}$  ft. to 12 ft., all of which are supplied in various types and drives.

If you are interested in a lathe let us know the size and type required for your work. We will send free, postpaid, a bulletin or catalog illustrating, describing, and pricing the lathe in detail.

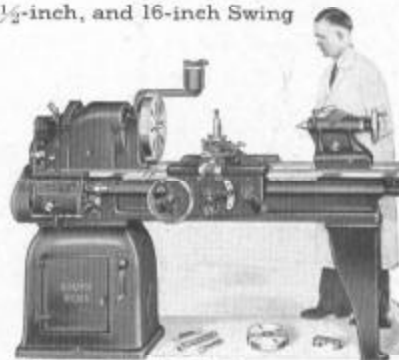


Fig. 67. 16" x 6' Quick Change Gear Underneath Belt Motor Drive Precision Lathe.

## Practical Attachments for South Bend Lathes

Thirty-eight practical attachments for machining various classes of work may be fitted to South Bend Lathes. These attachments may be ordered with the lathe or later when they are needed. Send for Attachment Bulletin No. 77-L and we will mail you a copy postpaid.

## Factory of the South Bend Lathe Works

The South Bend Lathe Works, established in 1906, has operated continuously under the same management for more than thirty years. The factory has a floor space of 180,000 square feet and a ground area of  $4\frac{1}{2}$  acres, all devoted exclusively to the manufacture of South Bend Back-Geared, Screw Cutting Precision Lathes, of which there are thousands in use.



Fig. 68. Factory of the South Bend Lathe Works, South Bend, Indiana, U.S.A.



## Valuable Books for the Mechanic

The bulletins listed below illustrate and describe how to handle general lathe work and seven major auto service jobs according to the latest shop practice that is followed in the most successful shops and plants in the United States. Thousands of mechanics are using these bulletins in their work. Order some of these for your mechanics—they may be helpful. Bulletins are 6" x 9" in size and contain from 8 to 160 pages each. When ordering specify the titles of the bulletins wanted and they will be mailed postpaid on receipt of price indicated. Coin or stamps of any country accepted.

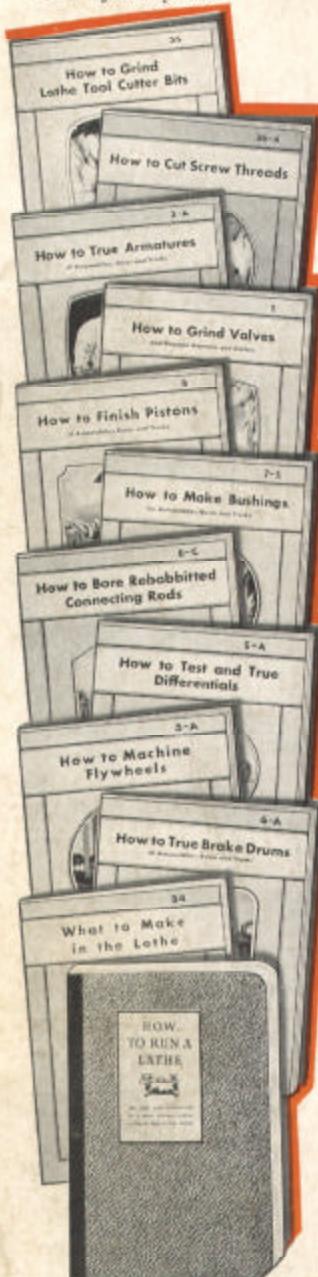


Fig. 69.

**"How to Grind Lathe Tool Cutter Bits"** Bulletin No. 35. Explains in detail how to sharpen various types of cutter bits for lathe work. 16 pages, size 6"x9", 50 illustrations. Price postpaid .....10c

**"How to Cut Screw Threads"** Bulletin No. 36-A. Explains various screw thread forms and how to cut screw threads in the lathe. 24 pages, size 6"x9", 65 illustrations. Price postpaid .....10c

**"How to True Armature Commutators and Undercut Mica"** Bulletin No. 2-A. (Automotive). Contains information on truing armature commutators and undercutting mica in the lathe. 12 pages, size 6"x9", 35 illustrations. Price postpaid .....10c

**"How to Grind Valves and Sharpen Reamers"** Bulletin No. 1. (Automotive). Contains information on refacing automobile engine valves, sharpening valve seat reamers, cutters, etc. 12 pages, size 6"x9", 23 illustrations. Price postpaid .....10c

**"How to Finish Pistons"** Bulletin No. 9. (Automotive) Contains detailed information on finishing semi-machined pistons in the lathe, reaming and honing wrist pin holes, etc. 12 pages, size 6"x9", 31 illustrations. Price postpaid .....10c

**"How to Make Bushings"** Bulletin No. 7-S. Contains information on making bushings, lathe mandrels, press fits and running fits. 12 pages, size 6"x9", 28 illustrations. Price postpaid .....10c

**"How to Bore Rebabbitted Connecting Rods"** Bulletin No. 6-C. (Automotive). Illustrates and describes the latest shop practice for boring, facing, and finishing rebabbitted connecting rods. 8 pages, size 6"x9", 25 illustrations. Price postpaid .....10c

**"How to Test and True Differentials"** Bulletin No. 5-A. (Automotive). Contains information on removing the old ring gear, testing and truing the ring gear seat, testing bearings of drive pinions, etc. 8 pages, size 6"x9", 20 illustrations. Price postpaid .....10c

**"How to Machine Flywheels"** Bulletin No. 3-A. (Automotive) Contains information on turning down flywheels for new starter ring gears. 8 pages, size 6"x9", 24 illustrations. Price postpaid .....10c

**"How to True Brake Drums"** Bulletin No. 4-A. (Automotive). Shows how to mount various types of brake drums in the lathe for truing the drum so that it will be concentric, round and true. 16 pages, size 6"x9", 40 illustrations. Price postpaid .....10c

**"What to Make in the Lathe"** Bulletin No. 34. Illustrates and describes over 65 useful projects for the home and shop including tools, grinders, and other useful objects, also various models such as steam and gas engines, locomotives, airplanes, etc. 28 pages, size 6"x9", 75 illustrations. Price postpaid .....10c

**"How to Run a Lathe"** (32nd Edition). This is an authoritative and instructive manual on the care and operation of a back-geared, screw cutting lathe. It gives the fundamentals of lathe operation in detail with illustrations of various classes of work. Contains 160 pages, size 5 1/4"x8", and more than 300 illustrations.

This book is used as a handy reference book by machinists and apprentices in industrial plants, railroad shops and machine shops, and is also used as a text book by students in educational institutions. It is considered the most popular text on lathe work in the world. More than a million and a half copies are in use. Price postpaid .....25c

**South Bend Lathe Works, 459 Niles Ave., South Bend, Ind., U.S.A.**

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