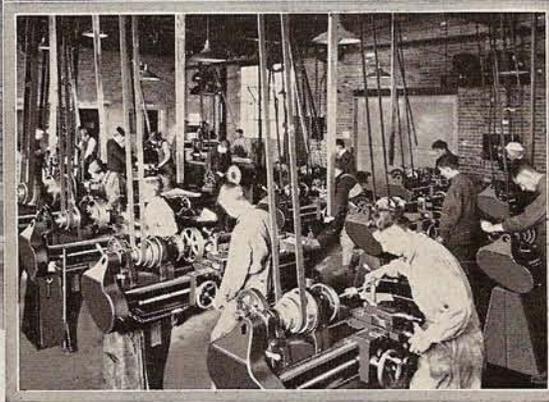
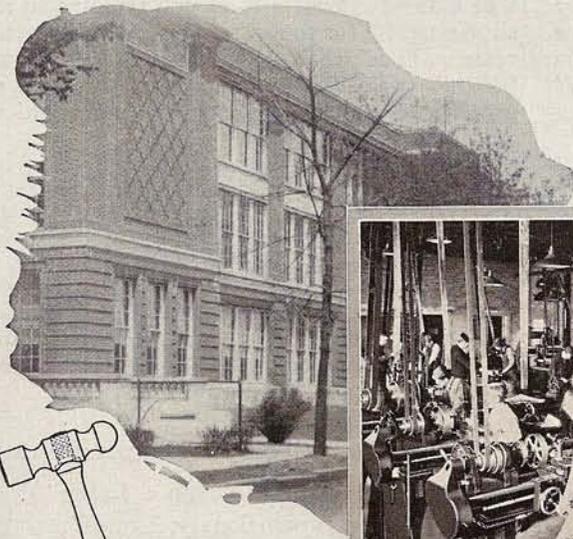
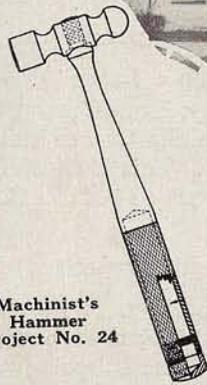


South Bend Machine Shop Course

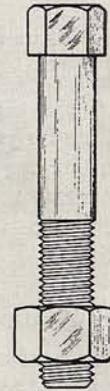
For Apprentices and Students in Machine Shops



Students at work in a School Shop

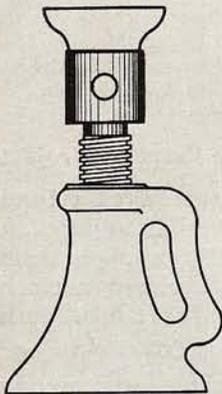


Machinist's Hammer
Project No. 24

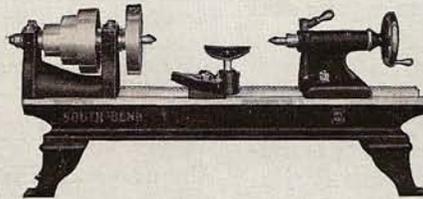


One-inch Bolt and Nut
Project No. 13

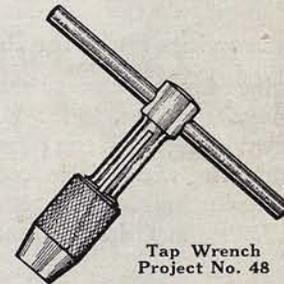
Bulletin No. 55



Jack Screw
Project No. 44



8-inch Bench Lathe
Project No. 68



Tap Wrench
Project No. 48

1930-'31

South Bend Lathe Works

425 East Madison St. South Bend, Indiana, U.S.A.



South Bend Machine Shop Course

The South Bend Machine Shop Course is based on production methods used in the building of machinery in industry. The Instruction Material is outlined and so arranged that the apprentice or student will become familiar with the best methods employed in present day machine shop practice.

5,000 Schools Using This Course

The South Bend Machine Shop Course has been very popular. More than 5000 Schools and nearly as many industrial plants and Railroad Shops use this Course. The Textbook used "How to Run a Lathe" enjoys nation wide reputation and is used by leading shop men everywhere.

30 Years' Experience to Develop Course

The Course affords a thorough training in machine shop practice for the apprentice and student. It represents, in addition to an investment of more than \$25,000, the carefully selected contributions of leading engineers, manufacturers and mechanics, gathered over a period of thirty years.

Outline of the Machine Shop Course

57 Projects—Job Sheets—Blue Prints—Textbook

The South Bend Machine Shop Course consists of 57 practical Projects covering the fundamental operations in machine shop practice. Job Sheets and Blue Prints have been worked out for each Project. Textbook, "How to Run a Lathe" is used. Material such as Castings, Steel and Hardware parts are furnished at the prices shown in the tabulation on page 3.

Copies of Drawings and Job Sheets

Duplicate copies of Blue Prints and Job Sheets of Projects in the South Bend Machine Shop Course can be made by your Mechanical Drawing Department and Business Department, thus enabling the Shop Instructor to use them for lectures, imparting the information to the class instead of to the individual boy.

Wide Range of Machine Shop Work

The Course consists of 57 Projects all of which are practical, useful and have a market value. The Projects cover a wide range of Machine Work beginning with simple elementary jobs and gradually advancing so that the more advanced Projects require skill equal to that of the expert mechanic.

Drawings and Blue Prints for Projects

Drawings for this Course should be made of standard size sheets 12 x 18-in. Each part of the Project is shown in detail on the Blue Print—also an assembly drawing which is in conformity with modern Engineering and Machine Shop Practice. A sample Blue Print, in reduced form, is shown on page 4.

Job Sheets for Each Project

Job Sheets 8½ x 14-in. compiled in folio form accompany the Blue Prints of each Project. Job Sheets explain the work from start to finish following the methods used in modern Machine Shop Practice. A sample Job Sheet is illustrated and explained on page 5.

Textbook on Lathe Operation

The Textbook "How to Run a Lathe" describing the fundamental operations on Screw Cutting Lathes is used in conjunction with the Course and is referred to in the Job Sheets. This Book is further illustrated and described on page 14 of this Bulletin.

Rough Castings for Projects

When a School is not in position to get castings locally we can supply them at the prices shown in the tabulated list on page 3. Some Schools prefer to copy the drawings, develop their own patterns and then order Castings locally or from a nearby foundry.

Note: Some Projects require planer work such as the Lathe Bed of the 8-Inch Bench Lathe Project No. 68. If a School is not equipped to do this work we can do it for them charging only the actual expense incurred in doing the job.

Steel and Hardware Parts for Projects

There are some Projects that require Steel and Hardware parts. If it is not possible to purchase these parts in your community we can supply them at the prices listed on page 3. These prices do not include the cost of postage or express but are f. o. b. South Bend.

Material and Castings for Projects

Prices on the Instruction Material such as Blue Prints and Job Sheets include postage. The prices of Rough Castings, Steel and Hardware parts on page 3 are f. o. b. factory, packed and boxed ready for shipment. They can be sent by express or freight as the customer desires.



Prices of Machine Shop Projects

Blue prints and job sheets are sent parcel post. Prices below include postage to any point in the world. Rough castings, hardware and steel parts are quoted F. O. B., South Bend, Ind. Delivered prices to any point in the U. S. A., and C. I. F., prices to any port in the world will be quoted on request.

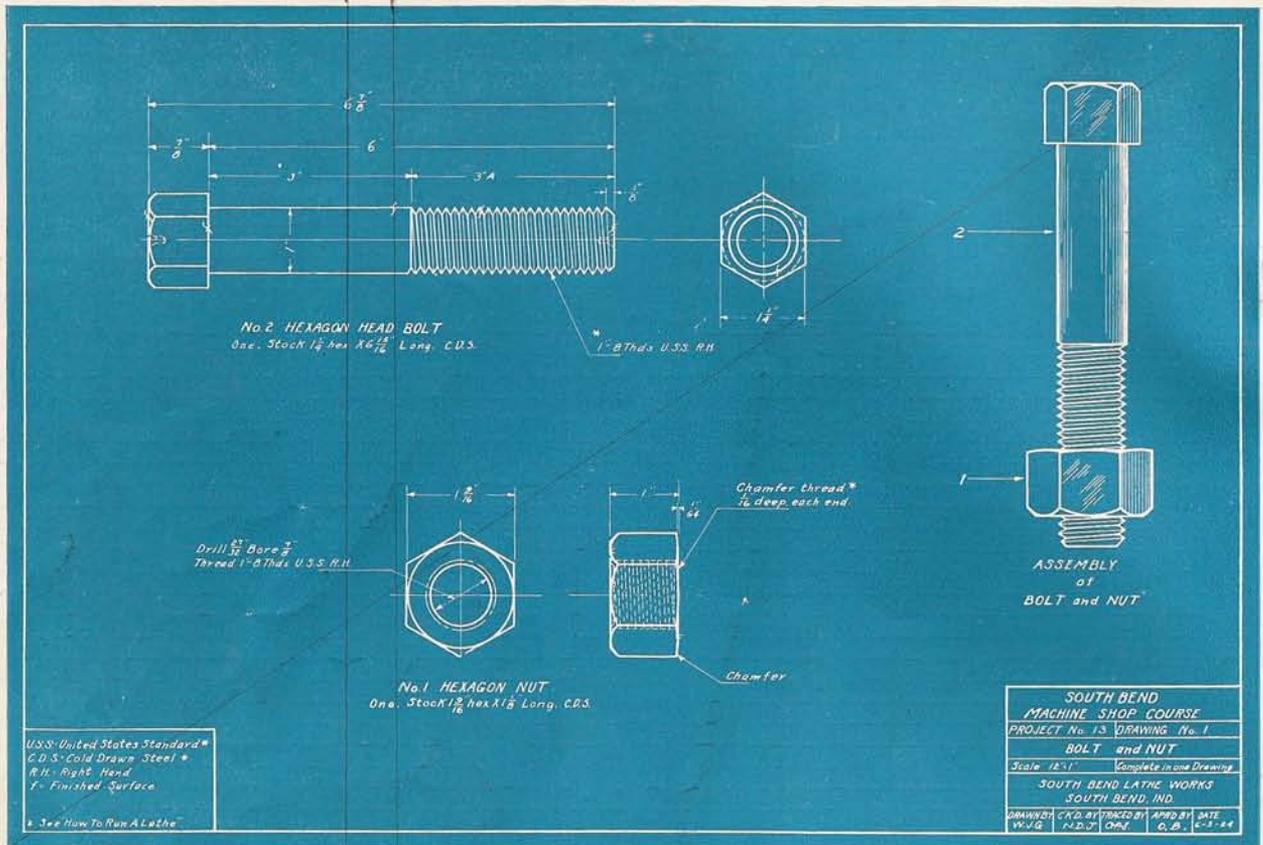
57 Practical Machine Shop Projects

Project Number	Name of Project	Projects Illustrated on Pages	No. of Blue Prints	No. of Job Sheets	Approx. Weight of Finished Projects	PRICES		
						Blue Prints and Job Sheets Postpaid	Rough Castings F. O. B. South Bend	Steel and Hardware F. O. B. South Bend
1	Nail Set	6	1	2	¼ lb.	\$0.35		\$0.10
2	Center Punch and Drift Punch	6	1	2	½ lb.	.35		.15
3	Plumb Bob	6	1	2	1 lb.	.35		.10
4	Steel Mandrel, or Arbor, for Lathe	6	1	3	2 lbs.	.45		.30
5	Tap Wrench, for ⅜-in., ½-in. and ⅝-in. Taps	6	1	2	3½ lbs.	.35		.25
6	60° Lathe Centers, Head and Tail	6	1	2	3½ lbs.	.35		1.00
7	Drill Chuck Arbor	6	1	2	2 lbs.	.35		.25
8	Drill Pad for Lathe	6	1	2	3 lbs.	.35	\$0.40	
9	Crotch Center for Lathes	6	1	2	2½ lbs.	.35	.40	
10	Blacksmith's Drill Chuck	6	1	3	2½ lbs.	.45	.45	
11	Cup Center, for Wood Turning	6	1	4	1½ lbs.	.55		.30
12	Spur Center, for Wood Turning	6	1	3	1½ lbs.	.45		.30
13	1-in. Bolt and Nut	6	1	4	5 lbs.	.55		.50
14	Pipe Center and Shank	6	1	5	10 lbs.	.65	1.25	.80
15	Screwdriver, Steel	7	1	4	1 lb.	.55		.20
17	Tool Post for a Lathe	7	1	8	6 lbs.	.95		.60
18	"C" Clamp	7	1	6	2 lbs.	.75		.30
20	Machinist's Clamp	7	1	4	1½ lbs.	.55		.50
21	Bell Centering Punch	6	1	4	2 lbs.	.55	.30	.10
22	Center Punch, with Sliding Sleeve Hammer	7	1	5	2 lbs.	.65		.40
23	Clamp Lathe Dog	7	1	5	3 lbs.	.65		.50
24	Machinist Hammer Kit	8	1	4	7 lbs.	.55		1.40
26	Taper Mandrel with Expansion Sleeve	7	1	6	20 lbs.	.75		3.25
27	Cast-Iron Pulley	7	1	2	12 lbs.	.35	1.75	
27½	Thread Gauge	6	1	3	½ lb.	.45		.15
29	Boring Bars for the Lathe	7	1	3	8 lbs.	.45	.50	1.00
30	Milling Cutter Arbor for Milling in Lathe	7	1	5	5 lbs.	.65		.75
31	Morse Taper Standard Test Plug	7	1	4	2 lbs.	.55		.25
32	Morse Taper Standard Test Gauge	7	1	4	2 lbs.	.55		.40
36	Machinist's Surface Gauge	8	1	9	5 lbs.	1.05	.40	.30
38	Chuck Back for Lathe Chucks	8	1	2	10 lbs.	.35	1.75	
39	Small Bench Vise, 2½-in. Jaws	8	1	9	18 lbs.	1.05		2.25
41	Mercury Plumb Bob	8	1	3	1 lb.	.45		.20
42	Machinist Jack Screw	7	1	4	1½ lbs.	.55		.25
44	Jack Screw for Heavy Duty	8	1	2	21 lbs.	.35	1.90	1.50
46	Cabinetmaker's Vise	8	1	6	25 lbs.	.75	2.20	.75
47	Adjustable Tap Wrench	8	1	4	1½ lbs.	.55		.60
48	Tap Wrench	Cover	1	3	2 lbs.	.45		.45
54	Polishing Head for Bench	9	3	7	30 lbs.	1.15	3.00	1.15
55	6-inch Improved Water Motor	11	3	6	12 lbs.	1.05	2.10	.15
58	Arbor Press	11	3	5	115 lbs.	.95	15.75	1.00
61½	Surface Plate	11	1	2	50 lbs.	.35	7.50	
62	Hand Power Emery Grinder	11	6	10	22 lbs.	1.90	2.10	.55
64	Lathe Set, Head Stock, Tail Stock, and Tool Rest for Wood Turning	10	5	10	58 lbs.	1.75	7.00	1.40
64½	Countershaft for Lathe Set	10	3	3	43 lbs.	.75	5.80	1.00
65	10-inch Bench Drill Press	9	6	15	88 lbs.	2.40		18.00*
66	8-inch Emery Grinder	10	5	4	50 lbs.	1.15	7.00	1.00
66½	Floor Column, Pan and Waterpot for 8-in. Grinder	10	7	2	80 lbs.	1.25	15.00	.25
67	Countershaft for 8-inch Emery Grinder	10	4	4	45 lbs.	1.00	5.50	1.00
68	8-inch Bench Lathe	9	11	17	120 lbs.	3.35	16.50	4.00
68½	Slide Rest for 8-inch Bench Lathe	9	4	8	16 lbs.	1.40	1.60	.50
69	Countershaft for 8-inch Bench Lathe	9	3	4	43 lbs.	.85	5.80	1.00
70	¼ H. P. Gasoline Engine, Vertical, Air Cooled	11	9	15	35 lbs.	2.85		8.00*
71	¼ H. P. Gasoline Engine, Horizontal	11	6	†	20 lbs.	3.00		20.00*
80	Model Airplane Engine	11	8	†	2 lbs.	3.00		16.50*
81	Electric Motor—¼ H. P.	11						Complete Information and Prices on Request.
82	Air Compressor	8						Complete Information and Prices on Request.

*Prices include both Castings and Steel Parts.
†Cannot furnish.

Prices of Engines do not include ignition coils, spark plugs or mixing valves

Blue Prints for Each Project in Machine Shop Course



Blue Print (Actual Size 12" x 18") for Project No. 13—1-Inch Bolt and Nut

Blue Prints Furnished Give Complete Working Details

The illustration above shows a reproduction of a typical Project Blue Print. One or more Blue Prints, as required, giving complete working details are furnished for each Project in the course. They are carefully drawn to scale and show each part of the Project in detail also an assembly drawing which is in conformity with modern engineering practice.

illustrated above

Blue Print for Project No. 13

The Blue Print for Project No. 13—1-In. Bolt and Nut presents the work in two parts. Part I the Hexagon Nut; Part II the Hexagon Head Bolt. Detailed drawings of each part are shown also an assembly drawing showing the completed Bolt and Nut. The Job Sheet for this Project is illustrated on page 5.

Industrial Form of Blue Print and Job Sheet

The Blue Prints and Job Sheets furnished for use in the South Bend Machine Shop Course are standard in size as used in industry. The Blue Prints are 12-in. x 18-in. The Job Instruction Sheets are 8 1/2-in. x 14-in.

Blue Prints are similar in every respect to the regular working drawings used in the large manufacturing plants and represent the best methods employed in modern shop practice.

For the Lecture Room

Lectures given by the Instructor from the Blue Prints and accompanying Job Sheets familiarize the students with the detailed work on each project. Correct procedure is then followed in the shop.

Copies of Blue Prints and Job Sheets

Any of the Blue Prints and Job Sheets used in the South Bend Machine Shop Course may be copied by your Business Department and Mechanical Drawing Department in order to provide copies for shop class use.

Prices of Job Sheets and Blue Prints

Job Sheets and Blue Prints for each Project are bound together complete in one folio, size 8 1/2-in. x 14-in. The prices include postage. If one or more Projects are desired in quantity, special prices will be quoted upon application.



Job Sheets for Each Project in Machine Shop Course

South Bend Machine Shop Course Job Sheet

Project No. 13

TO MAKE A 1" BOLT AND NUT

Page No. 1

MATERIAL REQUIRED:

Part No. 1 Cold Drawn Steel 1-9/16" Hex. x 1-1/8" long.
One Required.

Part No. 2 Cold Drawn Steel 1-1/4" Hex. x 6-15/16" long.
One Required.

PART NO. 1 HEXAGON NUT.

OPERATIONS:

1. Select stock as per blue print.
2. Place stock in 3 jaw Universal chuck with 1/4" extending and running true.* (P-65 to 71)
3. Arrange belt for proper spindle speed.* (P-50 to 52)
4. Set lathe tool for facing.* (P-53)
5. Face end.* (P-53)
6. Center end of stock. Use centering tool held in tool post.* (P-68)
7. Rough drill hole through stock as per blue print, with drill held in drill chuck in tail stock spindle.* (P-68)
8. Set tool for boring.* (P-33)
9. Bore hole to size as per blue print.
10. Arrange gears for cutting thread as per blue print.* (P-93-94-95-101)
11. Set tool for thread cutting.* (P-91)
12. Cut thread, leaving .005" stock for tap to remove.* (P-89 to 107)
13. Finish thread to size with tap, holding tap with wrench and guiding with tail stock center.* (P-121)
14. Chamfer thread as per blue print.
15. Chamfer outside corners lightly as per blue print.
16. Turn stock end for end in chuck, truing as before.
17. Face end to length as per blue print.

Job Sheet for Project No. 13 consisting of 4 pages and 1 Blue Print.

Job Sheets and Blue Prints for each Project in Course are bound together as shown, in folio form, size 8 1/2" x 14".

Job Instruction Sheets Explain the Work

Job Sheets are furnished for each Project giving specific instructions covering the proper procedure for doing the work. The Job Sheets have been worked out with the thought of acquainting the boys with the best methods employed in actual shop practice in industrial plants. One or more Job Sheets depending on the number required for the Project are furnished and give complete working details.

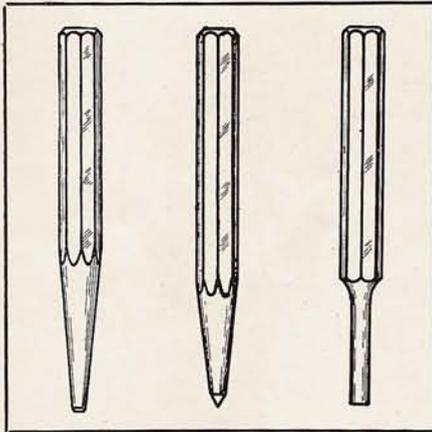
Job Sheet for Project No. 13

The Job Sheet for Project No. 13, 1-inch Bolt and Nut, consists of 4 pages and 1 Blue Print. The Project is handled in two parts. The first and second pages show the material required for producing both parts. The necessary operations for completing Part I, the Nut, follow in proper sequence. The operations for completing Part II, the Bolt, appear on pages 3 and 4.

Job Sheets Explain How to Do The Work Step-by-Step

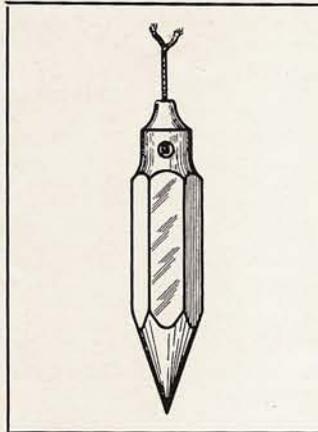
Job Instruction Sheets are made up to cover each Project listed in the South Bend Machine Shop Course. The Job Sheets are very thorough—each point has been worked out showing every operation step-by-step. They consist of Blue Prints and Instruction Sheets bound in folio form size 8 1/2-in. x 14-in.

Illustrations of Practical Machine Shop Projects

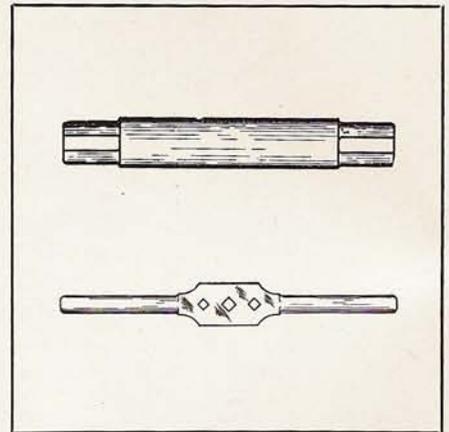


Project No. 1. Nail Set. Price: 1 Blue Print, 2 Job Sheets, \$.35. Steel and Hardware: \$.10. Weight, ¼ lb.

Project No. 2. Center Punch and Drift Punch. Price: 1 Blue Print, 2 Job Sheets, \$.35. Steel and Hardware: \$.15. Weight, ½ lbs.

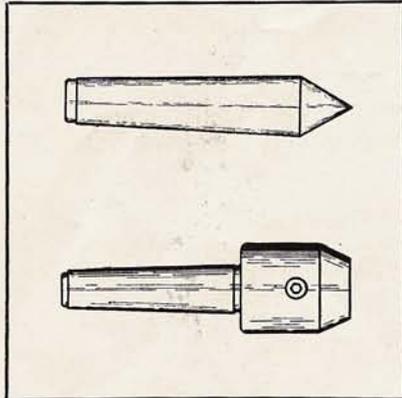


Project No. 3. Plumb Bob. Price: 1 Blue Print, 2 Job Sheets, \$.35. Steel and Hardware: \$.10. Weight, 1 lb.



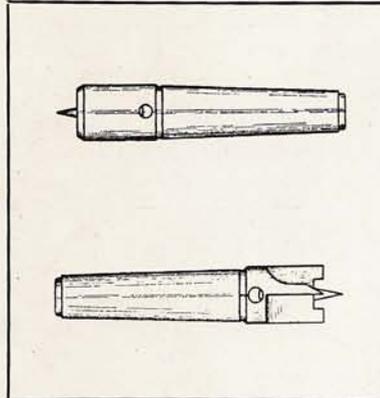
Project No. 4. Mandrel for Lathe. Price: 1 Blue Print, 3 Job Sheets, \$.45. Steel and Hardware: \$.30. Weight, 2 lbs.

Project No. 5. Tap Wrench. Price: 1 Blue Print, 2 Job Sheets, \$.35. Steel and Hardware: \$.25. Weight, ¾ lbs.



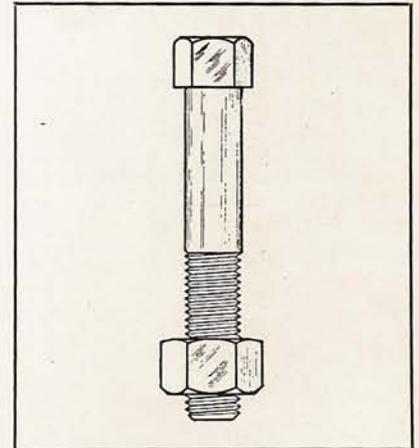
Project No. 6. 60 Degree Lathe Center. Price: 1 Blue Print, 2 Job Sheets, \$.35. Steel and Hardware: \$1.00. Weight, 3½ lbs.

Project No. 10. Blacksmith's Drill Chuck. Price: 1 Blue Print, 3 Job Sheets, \$.45. Rough Castings: \$.45. Weight, 2½ lbs.

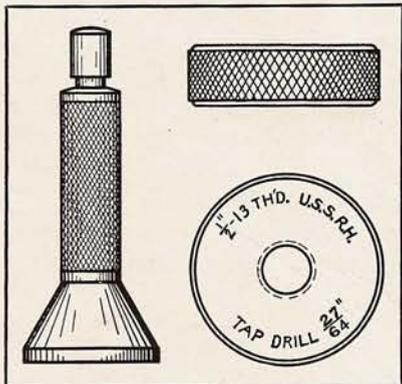


Project No. 11. Cup Center. Price: 1 Blue Print, 4 Job Sheets, \$.55. Steel and Hardware: \$.30. Weight, 1½ lbs.

Project No. 12. Spur Center. Price: 1 Blue Print, 3 Job Sheets, \$.45. Steel and Hardware: \$.30. Weight, 1½ lbs.

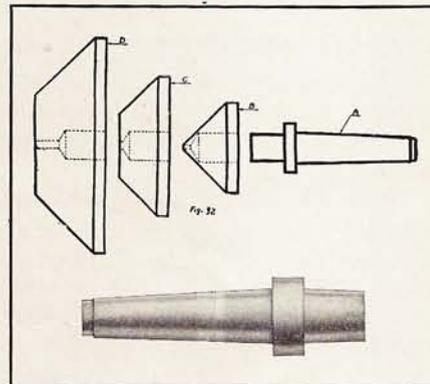


Project No. 13. 1-in. Bolt and Nut. Price: 1 Blue Print, 4 Job Sheets, \$.55. Steel and Hardware: \$.50. Weight, 5 lbs.



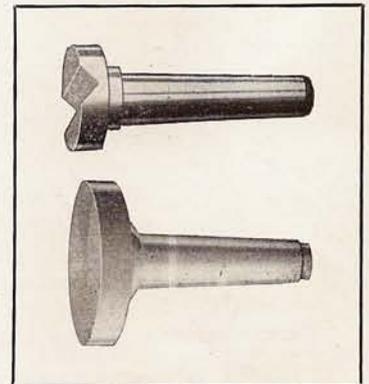
Project No. 21. Bell Centering Punch. Price: 1 Blue Print, 4 Job Sheets, \$.55. Rough Castings: \$.30. Steel and Hardware: \$.10. Weight, 2 lbs.

Project No. 27½. Thread Gauge. Price: 1 Blue Print, 3 Job Sheets, \$.45. Steel and Hardware: \$.15. Weight, ½ lb.



Project No. 14. Pipe Center and Shank. Price: 1 Blue Print, 5 Job Sheets, \$.65. Rough Castings: \$1.25. Steel and Hardware: \$.80. Weight, 10 lbs.

Project No. 7. Drill Chuck Arbor. Price: 1 Blue Print, 2 Job Sheets, \$.35. Steel and Hardware: \$.25. Weight, 2 lbs.

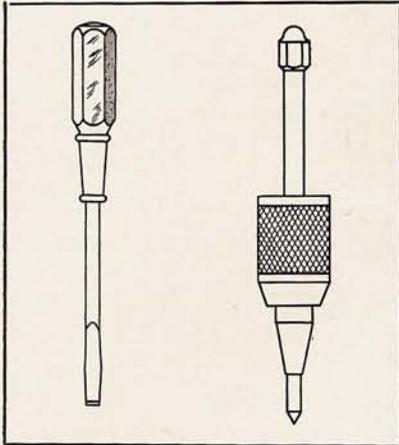


Project No. 9. Crotch Center for Lathe. Price: 1 Blue Print, 2 Job Sheets, \$.35. Rough Castings: \$.40. Weight, 2½ lbs.

Project No. 8. Drill Pad for Lathe. Price: 1 Blue Print, 2 Job Sheets, \$.35. Rough Castings: \$.40. Weight, 3 lbs.

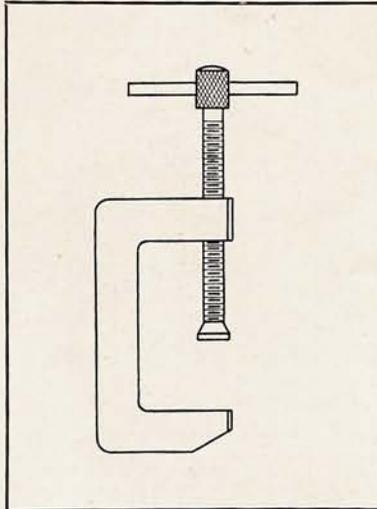


Illustrations of Practical Machine Shop Projects

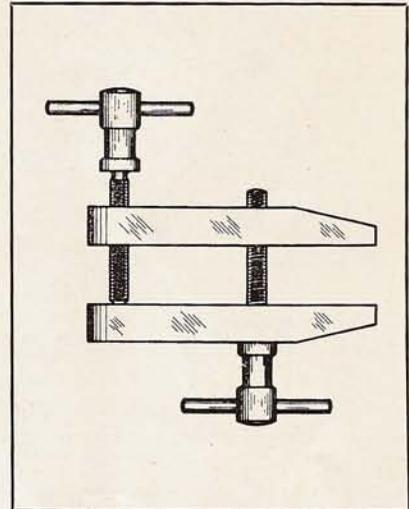


Project No. 15. Screwdriver, Steel. Price: 1 Blue Print, 4 Job Sheets, \$.55. **Steel and Hardware:** \$.20. **Weight,** 1 lb.

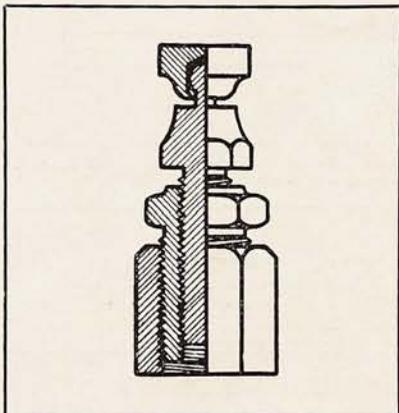
Project No. 22. Center Punch, with Sliding Sleeve Hammer. Price: 1 Blue Print, 5 Job Sheets, \$.65. **Steel and Hardware:** \$.40. **Weight,** 2 lbs.



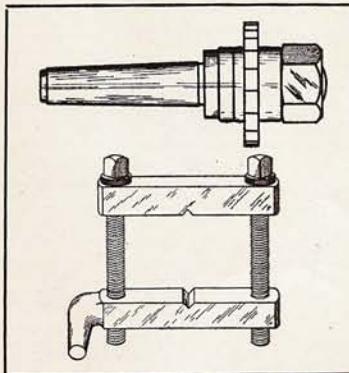
Project No. 18. "C" Clamp. Price: 1 Blue Print, 6 Job Sheets, \$.75. **Steel and Hardware:** \$.30. **Weight,** 2 lbs.



Project No. 20. Machinist's Clamp. Price: 1 Blue Print, 4 Job Sheets, \$.55. **Steel and Hardware:** \$.50. **Weight,** 1½ lbs.

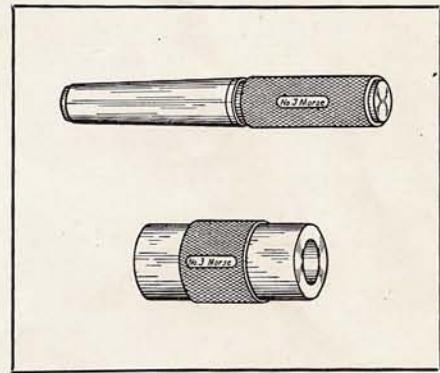


Project No. 42. Machinist's Jack Screw. Price: 1 Blue Print, 4 Job Sheets, \$.55. **Steel and Hardware:** \$.25. **Weight,** 1½ lbs.



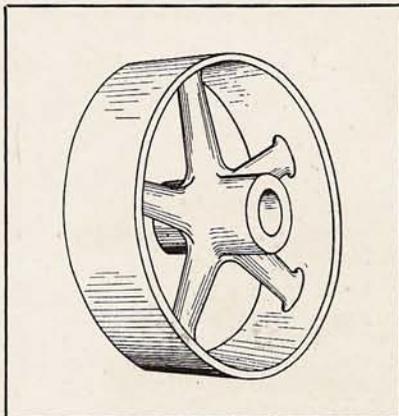
Project No. 30. Milling Cutter Arbor for Milling in Lathe. Price: 1 Blue Print, 5 Job Sheets, \$.65. **Steel and Hardware:** \$.75. **Weight,** 5 lbs.

Project No. 23. Clamp Lathe Dog. Price: 1 Blue Print, 3 Job Sheets, \$.65. **Steel and Hardware:** \$.50. **Weight,** 3 lbs.

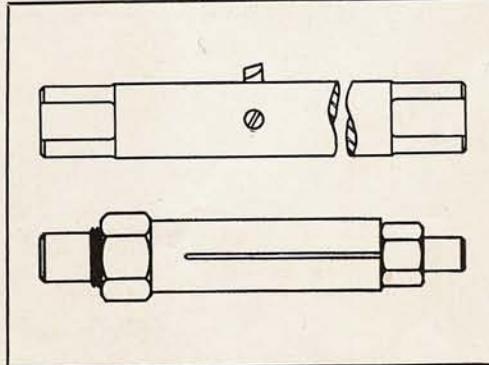


Project No. 31. Morse Taper Standard Test Plug. Price: 1 Blue Print, 4 Job Sheets, \$.55. **Steel and Hardware:** \$.25. **Weight,** 2 lbs.

Project No. 32. Morse Taper Standard Test Gauge. Price: 1 Blue Print, 4 Job Sheets, \$.55. **Steel and Hardware:** \$.40. **Weight,** 2 lbs.

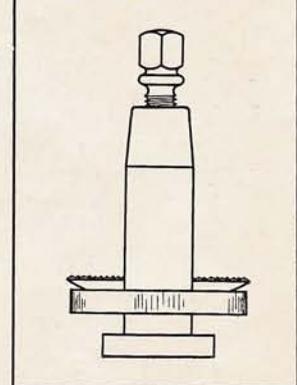


Project No. 27. Cast-Iron Pulley. Price: 1 Blue Print, 2 Job Sheets, \$.35. **Rough Castings:** \$1.75. **Weight,** 12 lbs.



Project No. 29. Boring Bars for the Lathe. Price: 1 Blue Print, 3 Job Sheets, \$.45. **Rough Castings:** \$.50. **Steel and Hardware:** \$1.00. **Weight,** 8 lbs.

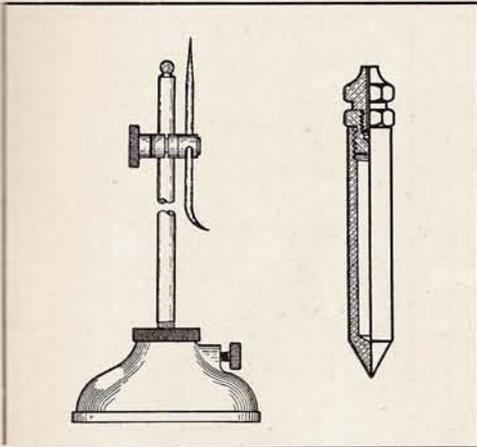
Project No. 26. Taper Mandrel with Expansion Sleeve. Price: 1 Blue Print, 6 Job Sheets, \$.75. **Steel and Hardware:** \$3.25. **Weight,** 20 lbs.



Project No. 17. Tool Post for a Lathe. Price: 1 Blue Print, 8 Job Sheets, \$.95. **Steel and Hardware:** \$.60. **Weight,** 6 lbs. **lbs.**

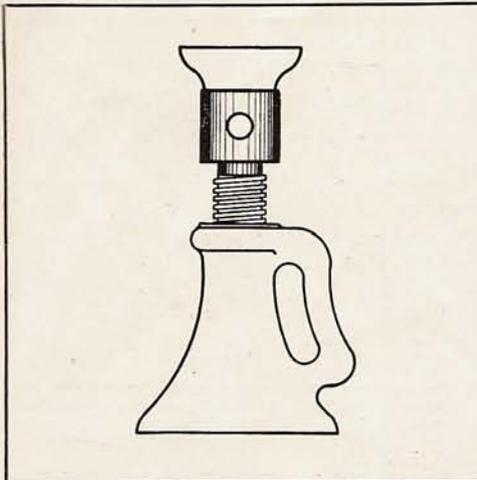


Illustrations of Practical Machine Shop Projects

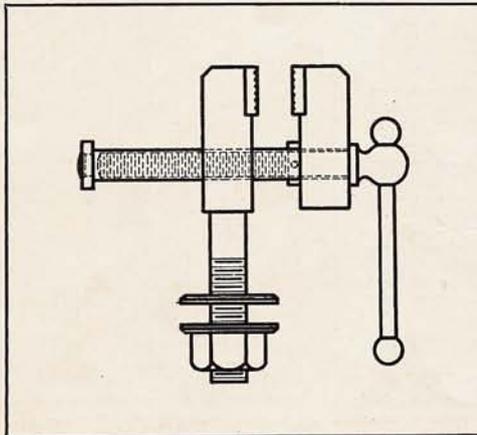


Project No. 36. Machinist's Surface Gauge. Price: 1 Blue Print, 9 Job Sheets, \$1.05. Rough Castings: \$.40. Steel and Hardware: \$.30. Weight, 5 lbs.

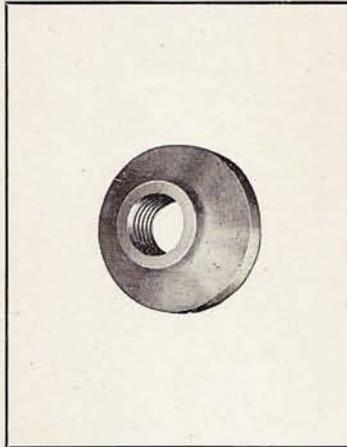
Project No. 41. Mercury Plumb Bob. Price: 1 Blue Print, 3 Job Sheets, \$.45. Steel and Hardware: \$.20. Weight, 1 lb.



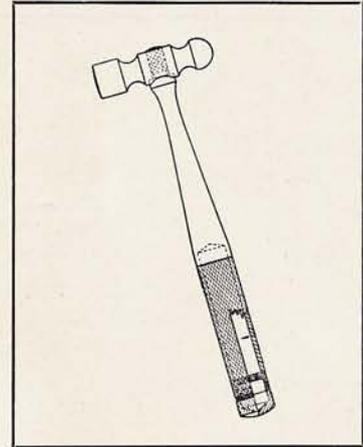
Project No. 44. Jack Screw for Heavy Duty. Price: 1 Blue Print, 2 Job Sheets, \$.35. Rough Castings: \$1.90. Steel and Hardware: \$1.50. Weight, 21 lbs.



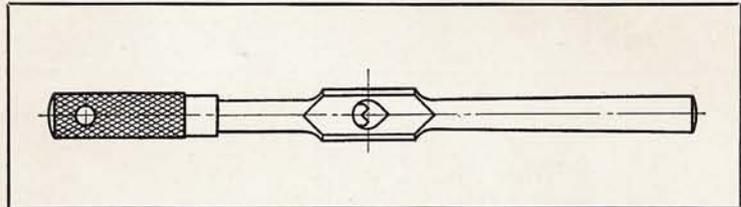
Project No. 39. Small Bench Vise, 2 3/4 -in. Jaws. Price: 1 Blue Print, 9 Job Sheets, \$1.05. Steel and Hardware: \$2.25. Weight, 18 lbs.



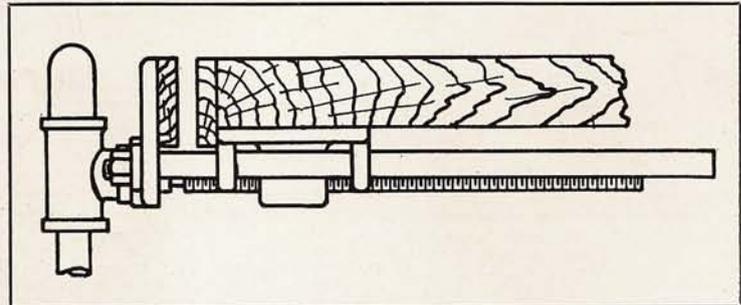
Project No. 38. Chuck Back for Lathe Chucks. Price: 1 Blue Print, 2 Job Sheets, \$.35. Rough Castings: \$1.75. Weight, 10 lbs.



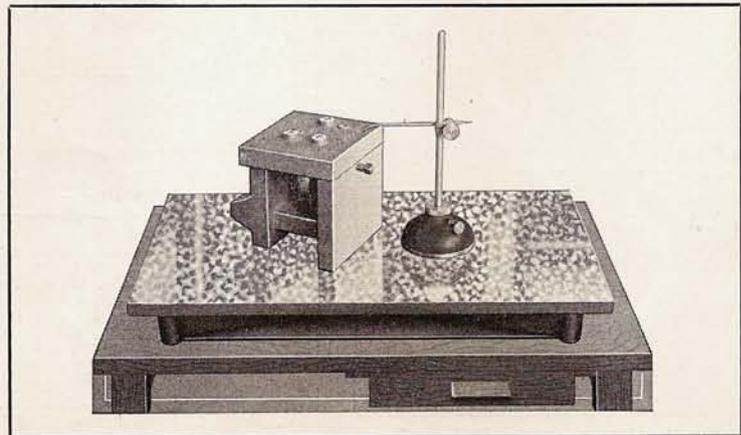
Project No. 24. Machinist's Hammer, with tools in handle. Price: 1 Blue Print, 4 Job Sheets, \$.55. Steel and Hardware: \$1.40. Weight, 7 lbs.



Project No. 47. Adjustable Tap Wrench. Price: 1 Blue Print, 4 Job Sheets, \$.55. Steel and Hardware: \$.60. Weight, 1 1/2 lbs.



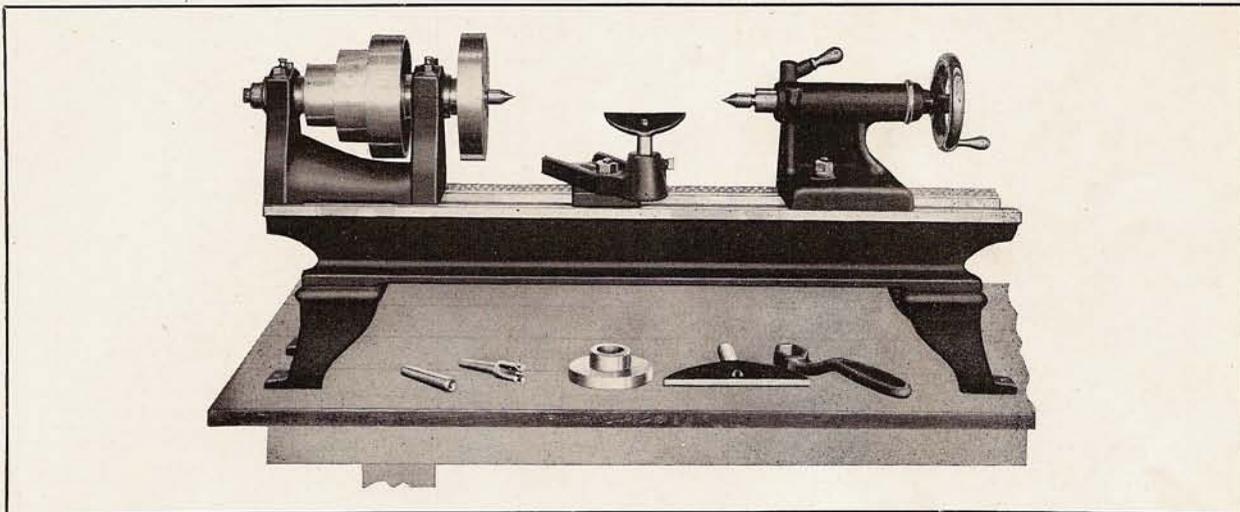
Project No. 46. Cabinetmaker's Vise. Price: 1 Blue Print, 6 Job Sheets, \$.75. Rough Castings: \$2.20. Steel and Hardware: \$.75. Weight, 25 lbs.



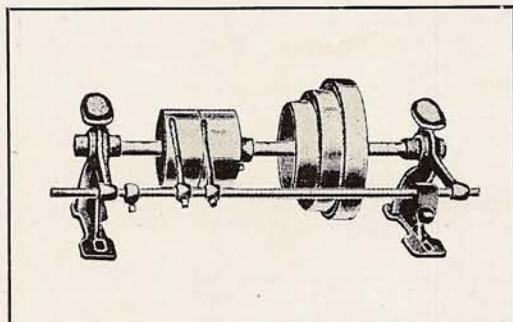
Project No. 61 1/2. Surface Plate. Price: 1 Blue Print, 2 Job Sheets, \$.35. Rough Castings: \$7.50. Weight, 50 lbs.



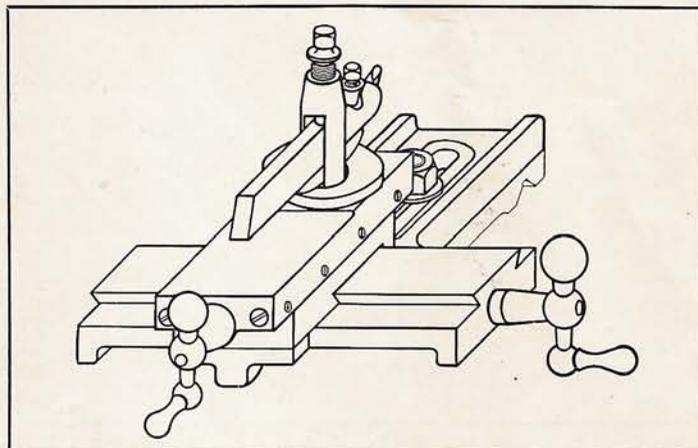
Illustrations of Practical Machine Shop Projects



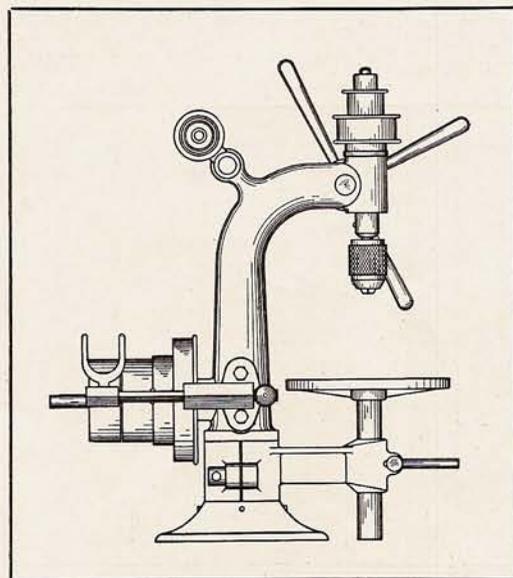
Project No. 68. 8-Inch Bench Lathe. Price: 11 Blue Prints, 17 Job Sheets, \$3.35. Rough Castings: \$16.50. Steel and Hardware: \$4.00. Weight, 120 lbs.



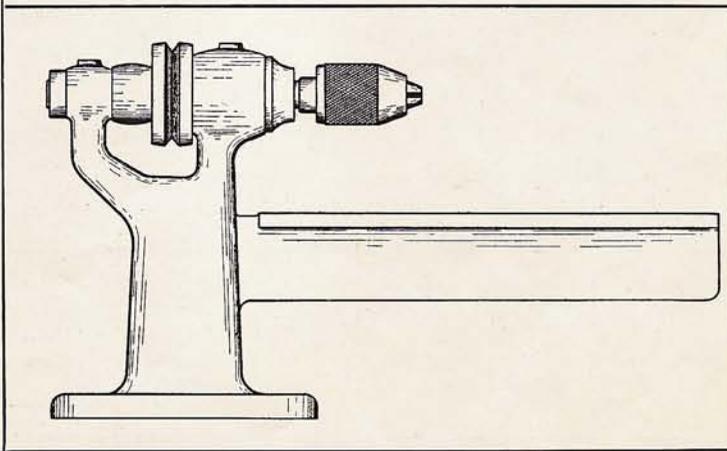
Project No. 69. Countershaft for 8-Inch Bench Lathe. Price: 3 Blue Prints, 4 Job Sheets, \$.85. Rough Castings: \$5.80. Steel and Hardware: \$1.00. Weight 43 lbs.



Project No. 68½. Slide Rest for 8-Inch Lathe. Price: 4 Blue Prints, 8 Job Sheets, \$1.40. Rough Castings: \$1.60. Steel and Hardware: \$.50. Weight, 16 lbs.



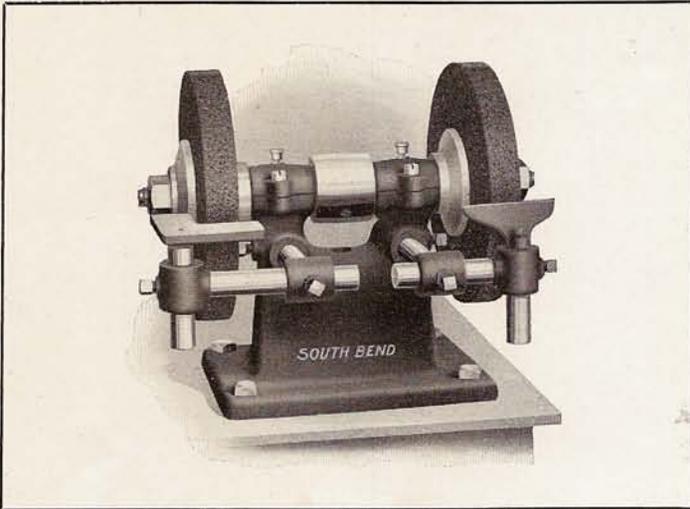
Project No. 65. 10-Inch Bench Drill Press. Price: 6 Blue Prints, 15 Job Sheets, \$2.40. Rough Castings and Steel Parts: \$18.00. Weight, 88 lbs.



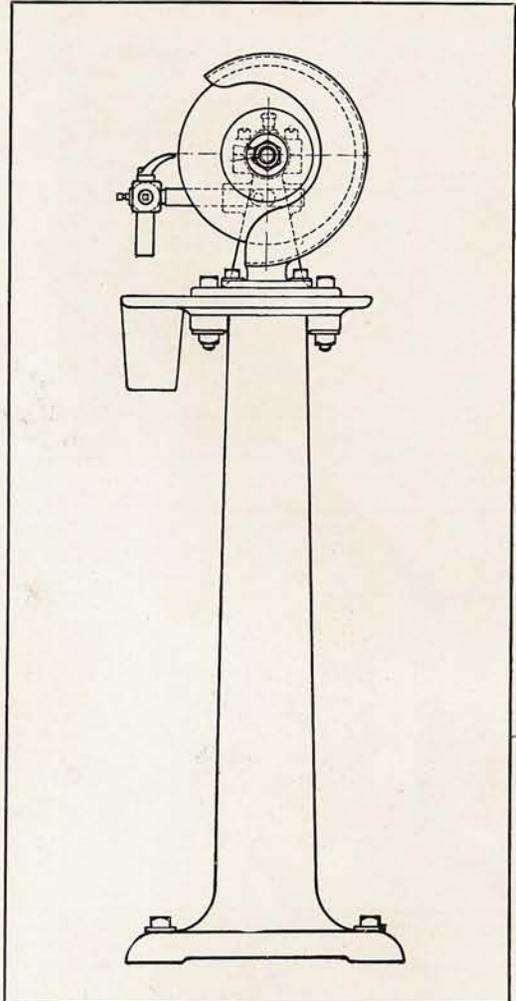
Project No. 54. Polishing Head for Bench. Price: 3 Blue Prints, 7 Job Sheets, \$1.15. Rough Castings: \$3.00. Steel and Hardware: \$1.15. Weight, 30 lbs.



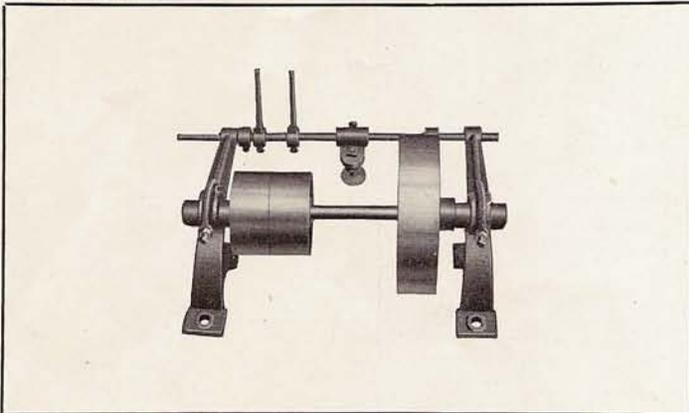
Illustrations of Practical Machine Shop Projects



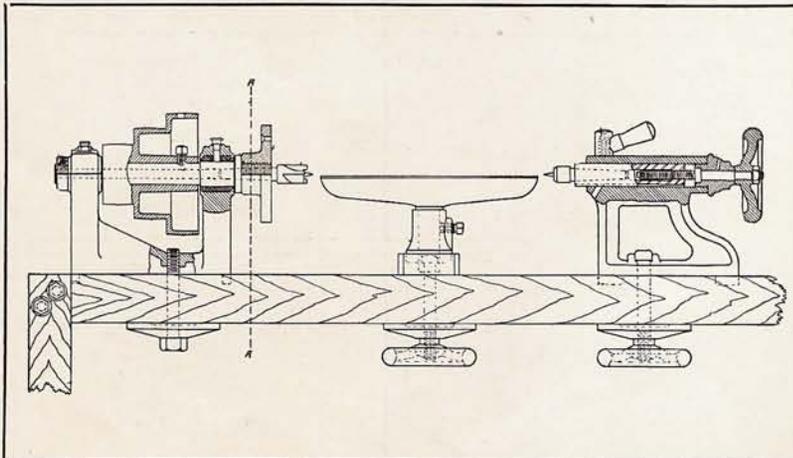
Project No. 66. 8-Inch Emery Grinder. Price: 5 Blue Prints, 4 Job Sheets, \$1.15. Rough Castings: \$7.00. Steel and Hardware: \$1.00. Weight, 50 lbs. Over 5,000 of these Grinders have been built by School Shop Students.



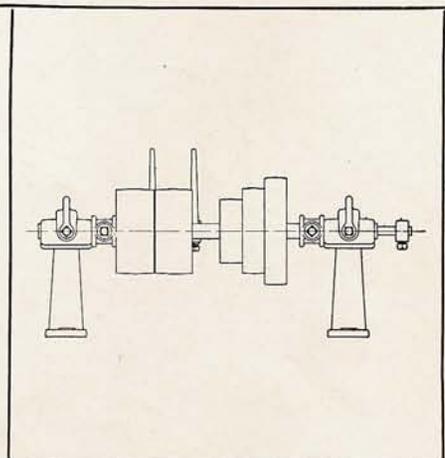
Project No. 66½. Floor Column, Pan and Waterpot for 8-in. Grinder. Price: 7 Blue Prints, 2 Job Sheets, \$1.25. Rough Castings: \$15.00. Steel and Hardware: \$.25. Weight, 80 lbs.



Project No. 67. Countershaft for 8-Inch Emery Grinder. Price: 4 Blue Prints, 4 Job Sheets, \$1.00. Rough Castings: \$5.50. Steel and Hardware: \$1.00. Weight, 45 lbs.

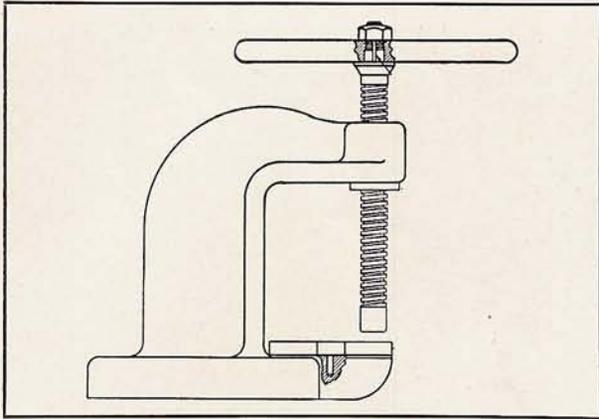


Project No. 64. Lathe Set, Head Stock, Tail Stock and Tool Rest, for Wood Turning. Price: 5 Blue Prints, 10 Job Sheets, \$1.75. Rough Castings: \$7.00. Steel and Hardware: \$1.40. Weight, 58 lbs.

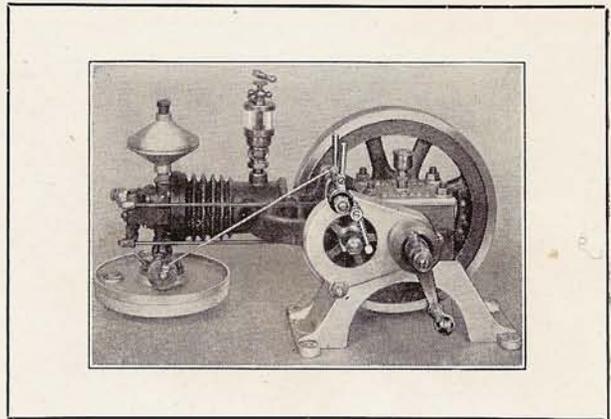


Project No. 64½. Countershaft for Lathe Set. Price: 3 Blue Prints, 3 Job Sheets, \$.75. Rough Castings: \$5.80. Steel and Hardware: \$1.00. Weight, 43 lbs.

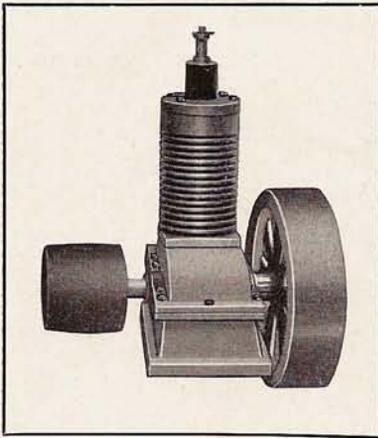
Illustrations of Practical Machine Shop Projects



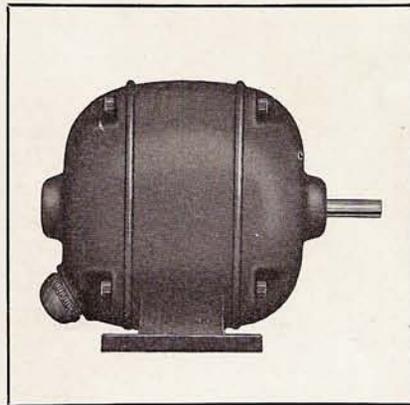
Project No. 58. Arbor Press. Price: 3 Blue Prints, 5 Job Sheets, \$.95. Rough Castings: \$15.75. Steel and Hardware: \$1.00. Weight, 115 lbs.



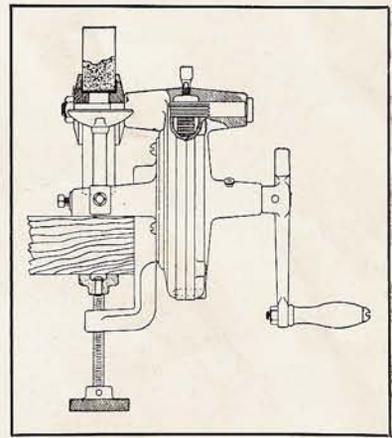
Project No. 71. 1/4 H. P. Gasoline Engine, Horizontal. Price: 6 Blue Prints, \$3.00. Rough Castings and Steel Parts: \$20.00. Weight, 20 lbs.



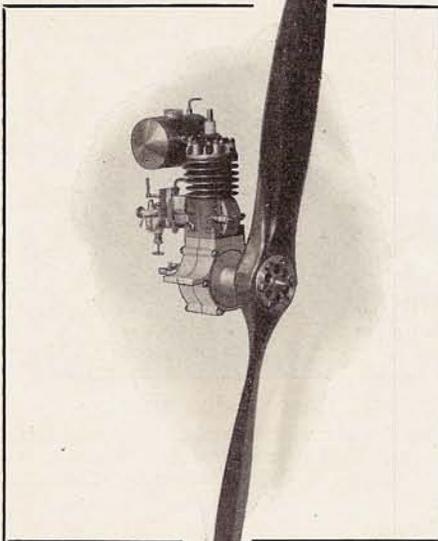
Project No. 82. Air Compressor. Designed by Harold Wills, Instructor, Jefferson High, Lafayette, Ind. Patterns made by J. Cotton Mather, Manual Training High School, Indianapolis, Ind. Prices on request.



Project No. 81: 1/4 H. P. Electric Induction Motor, Single-Phase, A.C., 60 cycle, 110-volt, 5.4 amperes, 1725 R. P. M., 40 deg. C., continuous rating. Weight, 32 lbs. Complete information and prices on request.

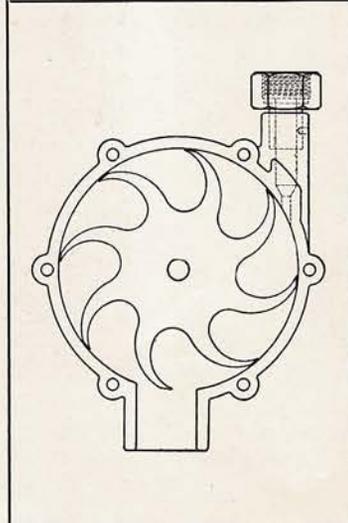


Project No. 62. Hand Power Emery Grinder. Price: 6 Blue Prints, 10 Job Sheets, \$1.90. Rough Castings: \$2.10. Steel and Hardware: \$.55. Weight, 22 lbs.

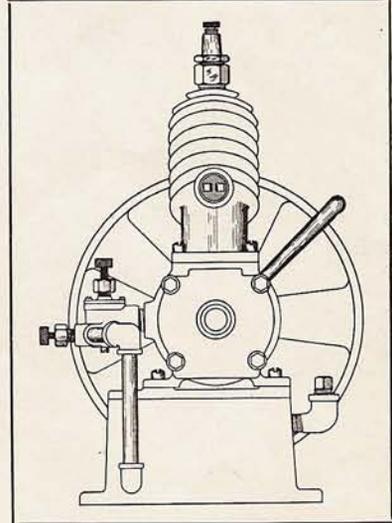


Project No. 80: Model Airplane Engine. Price: 8 Blue Prints, \$3.00. Rough Castings \$16.50. Weight, 2 lbs.

Project No. 55. 6-Inch Improved Water Motor. Price: 3 Blue Prints, 6 Job Sheets, \$1.05. Rough Castings: \$2.10. Steel and Hardware: \$.15. Weight, 12 lbs.



Project No. 70. 1/4 H. P. Gasoline Engine, Vertical Air Cooled. Designed and developed by Faculty of South Bend Vocational School, South Bend, Ind., G. F. Weber, Director. For prices see page 3.



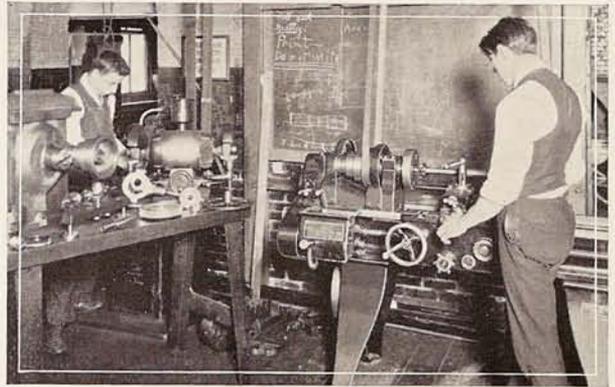
Project No. 80: Model Airplane Engine. Price: 8 Blue Prints, \$3.00. Rough Castings \$16.50. Weight, 2 lbs.

Typical Machine Shop Views



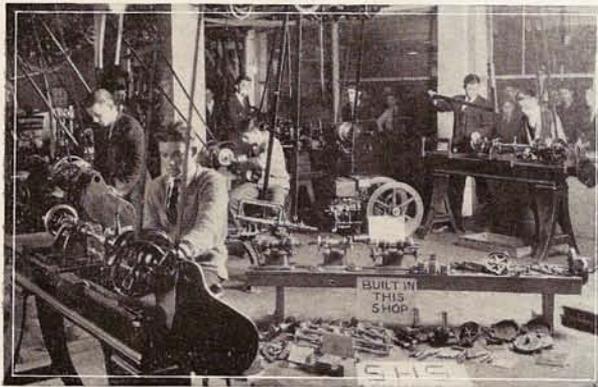
The Junior High School Shop

A number of boys operating Bench Lathes in a Junior High School Shop—their first experience in actual Machine Shop Practice.



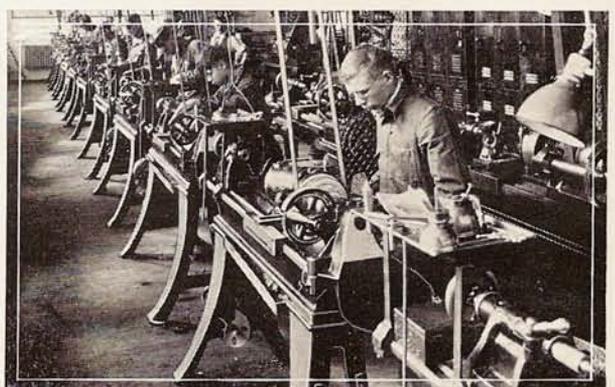
The General Shop

The General Shop handles a wide variety of trades including Machine work and affords the young mechanic a good opportunity for general Machine Shop Practice.



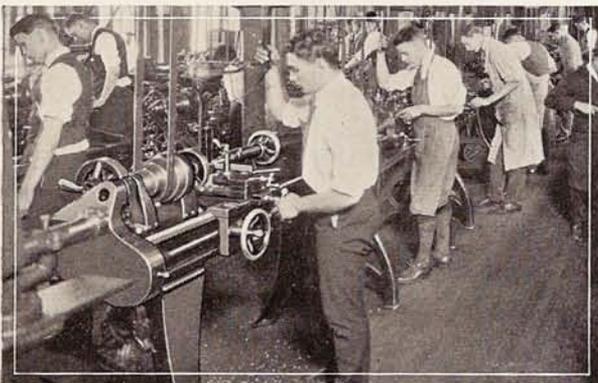
The Senior High School Shop

The illustration above shows a number of advanced students in a Senior High School Shop doing Machine Work.



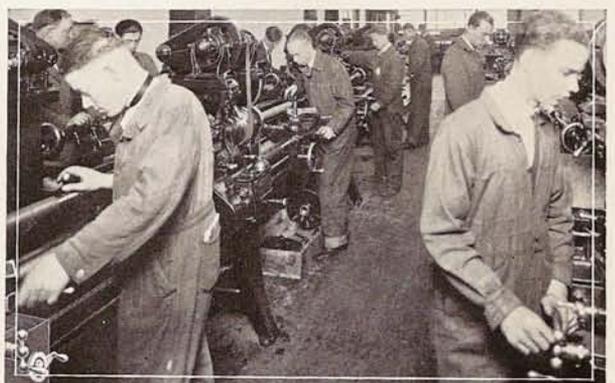
Night School Shop

The Night School Shop is popular with the Industrial day worker and laborer. It enables him to study and improve himself in the various classes of machine work during his spare time.



The Trade School

The illustration above is a common scene in the Trade School where the young man is being trained in correct Machine Shop Practice.



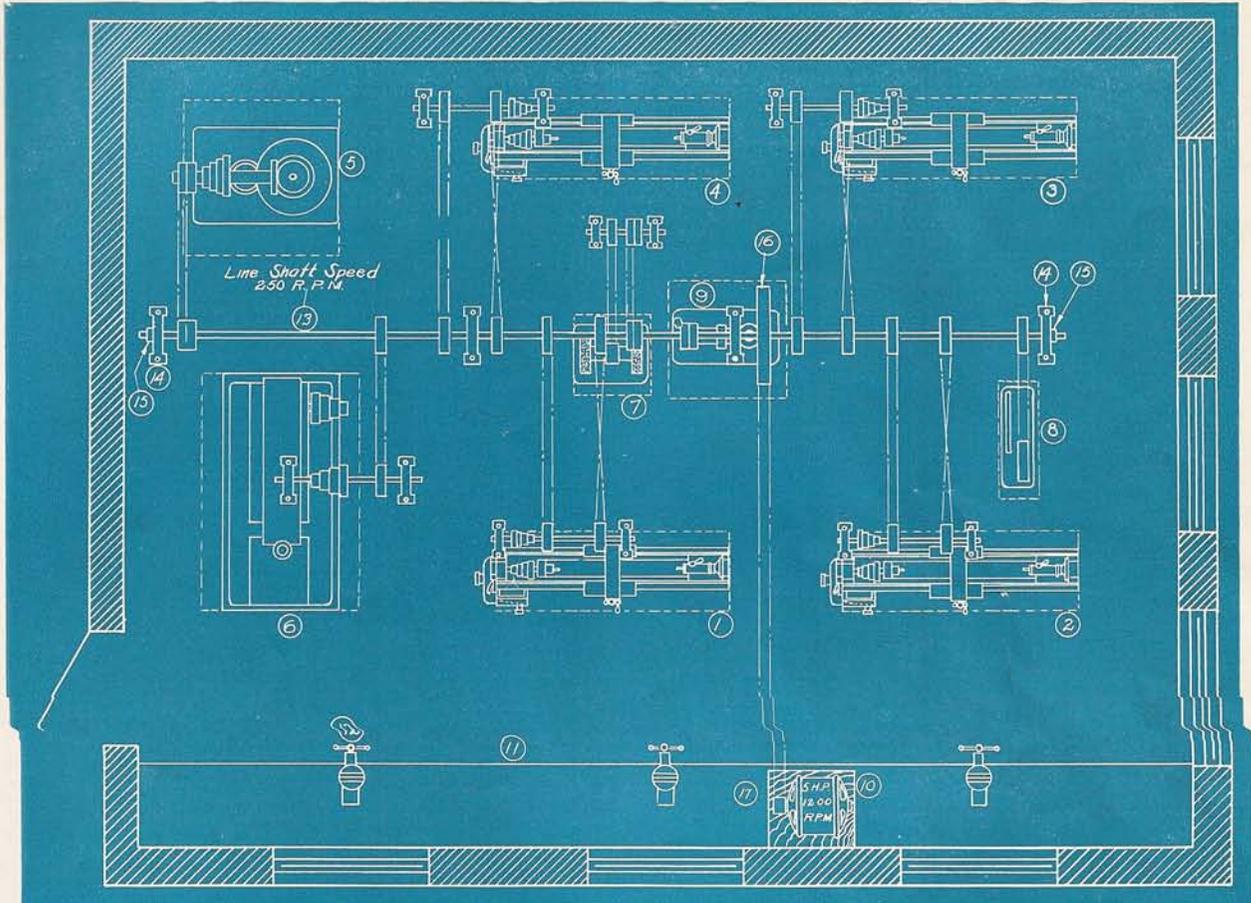
The College Engineering Shop

The Machine Shop Department of a College Engineering School is shown above. The Lathe plays an important part in the development of the young College Mechanical Engineer.

Successful Mechanical Geniuses

Henry Ford, the Wright Brothers, Thos. Edison, George Westinghouse, Dodge Brothers and many others acquired their fundamental training on the small Screw Cutting Lathe.

Planning the School Machine Shop



This is one of more than 150 Layouts that we have made for School Shops.

Engineering Service

The Supervisor or Instructor who is planning a new school machine shop and who cannot take the time to familiarize himself with all the details should write to us. We have had more than 21 years' experience in installing and equipping industrial and school shops. The benefit of all our experience is at your service. There is no charge whatever.

Plans, Estimates and Detailed Information on Shop Equipment

Supply us with the information indicated below and we will be able to furnish you with plans, estimates and detailed information on equipment for your new shop.

- (1) Number of boys to be taken care of in each period, and the number of periods per day.
- (2) Dimensions of the room, width, height and length. State whether shop is located on ground floor. Give the number of windows and doors and the location of same.
- (3) The amount of money available for equipment.

What South Bend Engineering Service Covers

The Engineering Service that we offer covers:

- (1) Blue Printed Plans drawn to scale showing a Floor Layout indicating the position of the machinery and equipment.
- (2) Elevation Views, etc.
- (3) A List of Tools and Equipment required together with an estimate of the entire cost.
- (4) Technical Information giving:
 - (a) The diameter and location of line shafting.
 - (b) Position and drop of hangers.
 - (c) Speed and size of shaft and pulleys.
 - (d) The number of feet of belting, etc.

Floor Plan Layout for Your New Shop

We have laid out 150 different School Shops. The Blue Prints of these layouts are free to the Supervisor or Instructor who contemplates equipping or enlarging the School Shop. Send us a drawing of the floor plan of the building indicating the number and position of windows and doors. If we have a print similar we will forward it, if not we will make a print to suit your conditions. Do not hesitate to ask any questions concerning the shop, or equipment, etc. This service is free.

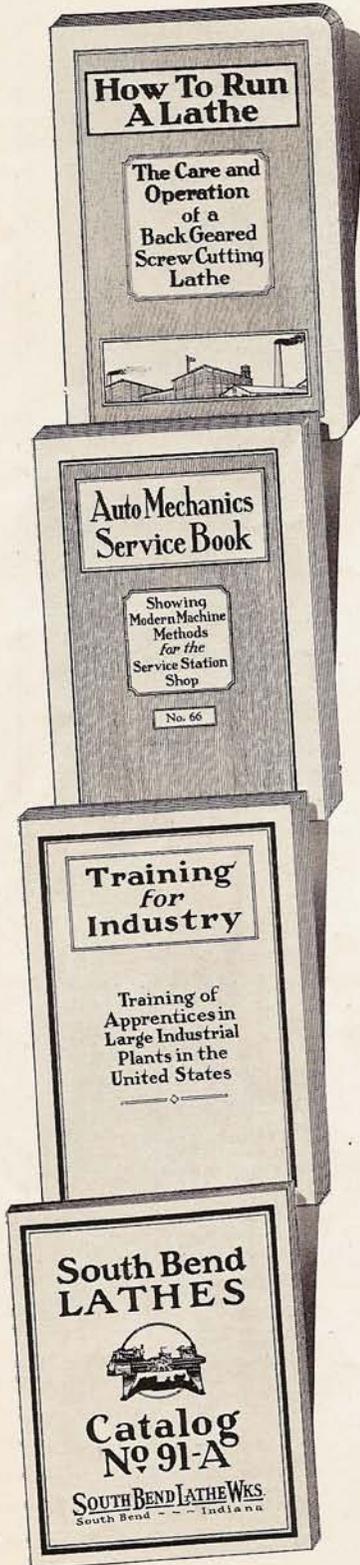
Size of Lathe for the School Shop

We are pleased to furnish information to Instructors on the size of Lathes best adapted for school shops in the various classes of work. The following Lathes are recommended for the various types of shops:

Junior High School.....	9-In. Junior, 9-In. Quick Change Gear, and 11-In. Quick Change Gear Lathes' either Bench or Floor Leg Type.
Senior High School.....	11-In., 13-In., and 15-In. Quick Change Gear Lathes.
Trade School.....	13-In. and 15-In. Quick Change Gear Lathes.
General Shop.....	13-In., 15-In. and 16-In. Quick Change Gear Lathes.
Night School Shop.....	13-In., 15-In. and 16-In. Quick Change Gear Lathes.
College Engineering Shop.....	13-In., 15-In. and 16-In. Quick Change Gear Lathes.



Write for These Valuable Books



"How to Run a Lathe"

Authoritative Manual on Lathe Work

Competent authorities say that this is one of the most complete books written on the subject of the back geared screw cutting lathe. This book is 5¼"x8" and contains one hundred and sixty pages and more than three hundred illustrations, all devoted to the erection, installation and operation of the screw cutting lathe.

"How to Run a Lathe" is used by large industries such as Ford Motor Co., Bethlehem Steel Co., New York Central Railroad, etc., for apprentice school training, and by public schools, colleges, universities and private schools all over the world. Accepted as a text and reference book everywhere.

Four hundred different types of lathe jobs in modern machine shop practice are illustrated and described in this book. More than one million copies have been published in the last twenty-three years. One of these books will be found in the equipment of each South Bend Lathe.

Mailed Anywhere in the World, Postpaid, Price 25 Cents.
Coin or Stamps of Any Country Accepted.
Sample Copy Free to Educators.

Partial List of Contents

- How to Set Up the Lathe
- Care of the Lathe
- How to Lay Out a Shop
- How to Level a Lathe
- How to Hang a Countershaft
- Calculating Size and Speed of Pulleys
- How to Lace a Belt
- Grinding and Setting Lathe Tools
- Cutting Screw Threads
- Turning and Boring Tapers
- Grinding and Milling Work
- Chucks and Face Plates
- Cutting Speeds of Metals
- Cutting Feeds for Metals
- Operating Automatic Feeds
- Reading Micrometer Calipers
- Using Outside and Inside Calipers
- Locating Center Holes
- Aligning Lathe Centers
- Drilling, Boring, Reaming, Tapping
- Use of Compound Rest
- Table of Decimal Equivalents
- Table of Metric Measures
- 300 Other Shop Kinks

Auto Mechanics' Service Book

A Reliable Guide for Machining Motor Parts

This booklet is especially for the automobile mechanic. It describes and illustrates the modern methods of machining parts of the automobile motor. The best ways to do the machine work on jobs are carefully explained in detail. This 6"x9" book contains 96 pages and more than 150 illustrations of practical ways to do different jobs. It is recommended by automobile manufacturers for use in their Service Station Shops throughout the world as a reliable guide for servicing motors with precision, speed and economy.

Mailed Anywhere in the World, Postpaid, Price 25 Cents.
Coin or Stamps of Any Country Accepted.
Sample Copy Free to Educators.

Partial List of Contents

- Finishing Pistons
- Truing Commutators
- Refacing Valves
- Making Bushings
- Machining Flywheels
- Boring Connecting Rods
- Centering and Countersinking
- Truing Brake Drums
- Cutting Screw Threads
- Truing Crankshafts
- Grinding
- Axles and Driveshafts
- Drilling, Boring, Reaming
- Making Mandrels and Adapters

Training for Industry

Industry's Method of Teaching

This sixteen-page booklet tells what some of the big industrial plants of the United States are doing to "train the boy and apprentice for industry." It outlines the courses offered by such nationally known concerns as Westinghouse Electric and Manufacturing Company, General Electric Company, Reo Motor Car Company, Packard Motor Car Company, United Shoe Machinery Company and other industrial leaders.

Modern educators, everywhere, knowing that the vocational school is the logical training ground for skilled mechanics, are endeavoring to give the boy the type of training that will gain for him recognition by industrial leaders. It is in the interest of furthering vocational education that this booklet is offered. Not for general distribution but will be sent to all Superintendents, Principals, Supervisors and Shop Instructors on request.

Industries Covered

- Automobile Manufacturers
- Electrical Equipment Manufacturers
- Metal Working Industries
- Railroads
- Steel Mills
- Shoe Machine Manufacturers

Trades Covered

- Tool Making
- Die Making
- Machinist
- Mechanical Drawing

New Lathe Catalog No. 91-A

Complete Information on South Bend Lathes

This new one hundred and four page Catalog, No. 91-A, illustrates, describes and prices the entire line of ninety-six sizes and types of New Model South Bend Back Geared Screw Cutting Lathes, from 9-inch swing to 18-inch swing, Countershaft and Motor Drive. Each size of lathe is fully described with its features and specifications.

A full line of Attachments, Chucks, Tools and Accessories for use on South Bend Lathes is also shown.

This catalog is 6"x9", it has more than three hundred illustrations and is a reference book of considerable value to anyone who is interested in mechanical equipment.

Mailed Anywhere in the World, Free, Postpaid, No Charge

Partial List of Contents

- Quick Change Gear Lathes
- Standard Change Gear Lathes
- Tool Room Precision Lathes
- Gap Bed Lathes
- Brake Drum Lathes
- Large Swing Lathes
- Taper Attachment
- Grinding Attachment
- Silent Chain Motor Driven Lathes
- Self-Contained Motor Driven Lathes
- Horizontal Motor Driven Lathes
- Simplex Motor Driven Lathes
- Junior Bench and Floor Leg Lathes
- Draw-in Collet Chuck Attachment
- Milling & Keyway Cutting Attachment
- Chucks, Tools and Accessories



The Vocational Training and Trade Schools and Their Relation to Industry

A Comment on Vocational Education as seen by a Leading Engineer and Manufacturer of Machinery of over 30 years Industrial Experience from Apprentice to Factory President

The industrial plants of the United States are very much interested in the Vocational and Trade Schools, which are doing remarkable work for the boys of their own communities and for the industries of the entire United States. For example, the metal-working industry is aware that vocational schools can teach the fundamentals of the machinist's trade to the youth much better than they can be taught in industry's own factories. This is true because in the vocational school there is a trained teacher who not only teaches the boys in the work but explains reasons for doing so. The boy also gets shop arithmetic, beginners' course in mechanical drawing, heat-treating and general instructions on metal, etc.

The average manufacturer looks upon the mechanical draftsman as a tradesman and employs him as such. Many of the mechanical draftsmen in the factories are young men that have learned mechanical drawing in the High School and have not had the means or opportunity to go to an engineering school. There are a great many young men of ability with no college training who are doing excellent work as draftsmen, and many of these men have become foremen, superintendents and shop owners.

The manufacturer looks on the general shop in the rural district as a sort of trade guidance that is teaching the fundamentals of the trade that they find is best suited for the boy. The High School Vocational Shop is doing some good training in the fundamentals of trade work. The average graduate is accepted in the industry and practically given credit for two years of apprenticeship and is paid accordingly; that is, from 30c to 50c an hour, depending upon the type of trade. The High School Graduate who has shown special talent and mechanical ability in the Vocational School, where sincerity of purpose is included, is taken on as first-class tradesman and is paid journeyman's wages. The men from that class are most prized by industry.

It is understood that in the general shop and in vocational training that the boys select a trade but do not further specialize in that trade, until they reach industry, because it is there that specialization begins.

Industry looks to vocational and trades training schools to supply young men, not for the ordinary job of operating machines in hum-drum work, but they want them on account of their vocational training, so that they can be further trained for positions of expert skilled workmen, specialty mechanics, foremen, superintendents, salesmen, and advertising men.

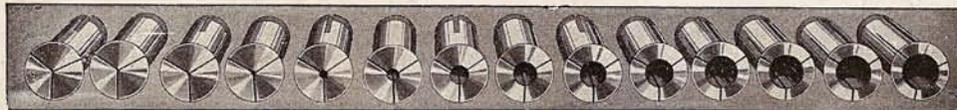
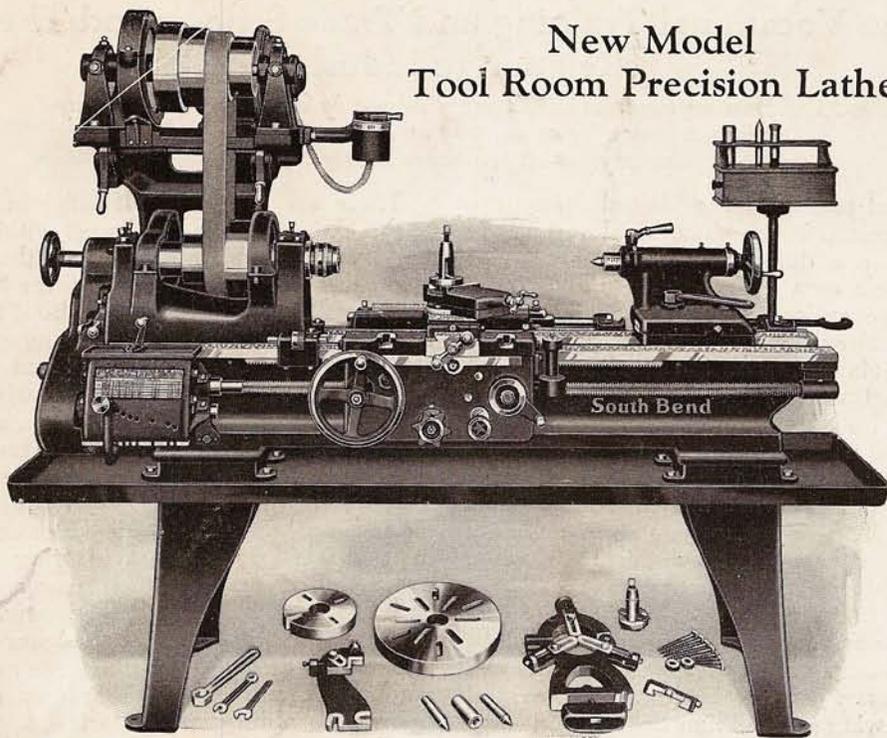
There are a number of large industrial plants in the United States that have, within the last five years, started training courses in their own plants. For example, the Hudson Motor Car Company of Detroit, Michigan, started about four years ago selecting 25 of their ablest young workmen, who showed promising talent, and put them through a four-year course, which is equivalent to an engineering course. These young men, some of whom were skilled mechanics, department foremen, salesmen with mechanical ability, mechanics and draftsmen who leaned to advertising and merchandising had about two hours of lecture daily in the factory from engineering professors of a nearby university. Each year another class of twenty-five is selected. The brightest of these men, after graduation, climb higher than the average engineer in that they become assistants to the leading executives of the plant, all depending upon their ability and experience.

The man in greatest demand in industry is what we call the genius. One of these men will be found in every successful factory, large and small. He is a man who may be an ordinary mechanic or an inventor.

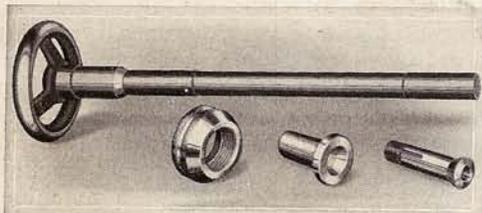
There is a great deal of difference between the skilled workman and the mechanic. The skilled workman is one who, given a blueprint to make a set of dies or tools, will turn out an excellent job, accurate in every detail, and, when finished, the device will operate successfully. The mechanic, however, is a man to whom the superintendent can give a sheet-metal buckle and say, "Bill, get up some kind of a machine to make these buckles in quantities — we want to make them in the hundreds of thousands." Bill will make the machine for producing the buckle and it will turn them out in great quantity. He has no drawings to speak of and the machine will probably look like an old-time farm reaper, but it will do the work.

Every factory in the metal-working industry has a great many special machines that are built in their own shops. These machines are used in the manufacture of their product. These machines are designed so that rapid production can be obtained and at the same time the product can be turned out with the greatest accuracy and precision and at the least possible cost. It is the genius that manages this, and that genius is not always the high-priced engineer, nor the superintendent of the plant. He is the man with ideas — the inventor, and he may be one of the humblest workmen in the plant, or he may be the president himself.

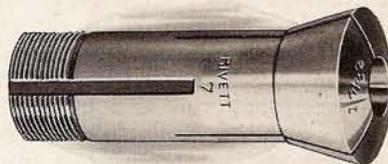
New Model Tool Room Precision Lathe



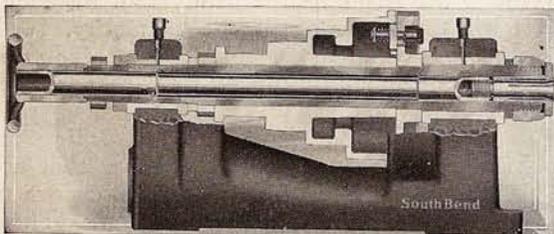
Collets are made in Steps of 1/64-inch and up for Draw-in Chuck Attachments. Hardened and Ground



Hand Wheel Draw-in Collet Chuck Equipment



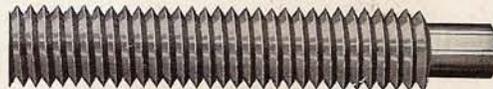
Collet for Use in Draw-in Collet Chuck Attachment



Sectional View Showing Collet Chuck in Headstock



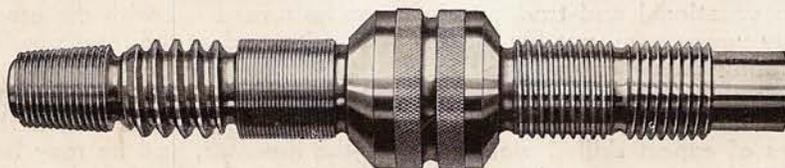
Acme Double Screw Thread



American National Screw Thread



Double Screw Square Thread



Special Screw Showing Various Types of Threads