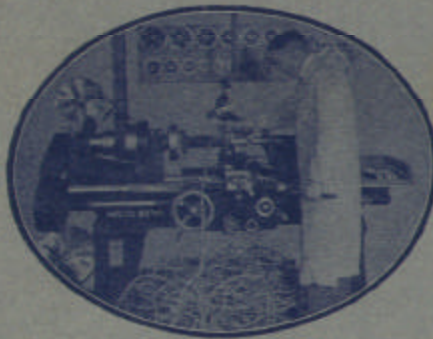


227 268

MACHINE SHOP EQUIPMENT *for Vocational and Industrial Schools*

Showing Interior Views of Some School Machine Shops



SOUTH BEND LATHE WORKS :: SOUTH BEND, INDIANA

MACHINISTS WANTED

The demand for machinists is so great and the supply so limited in almost every city in the United States that many manufacturers have a standing offer with Vocational and Industrial Schools for the employment of all young men who have finished the machine-shop course.

**More than 450 Schools in the United
States are using South Bend Lathes**

MACHINE SHOP EQUIPMENT *for Vocational and Industrial Schools*

EDITION No. 2

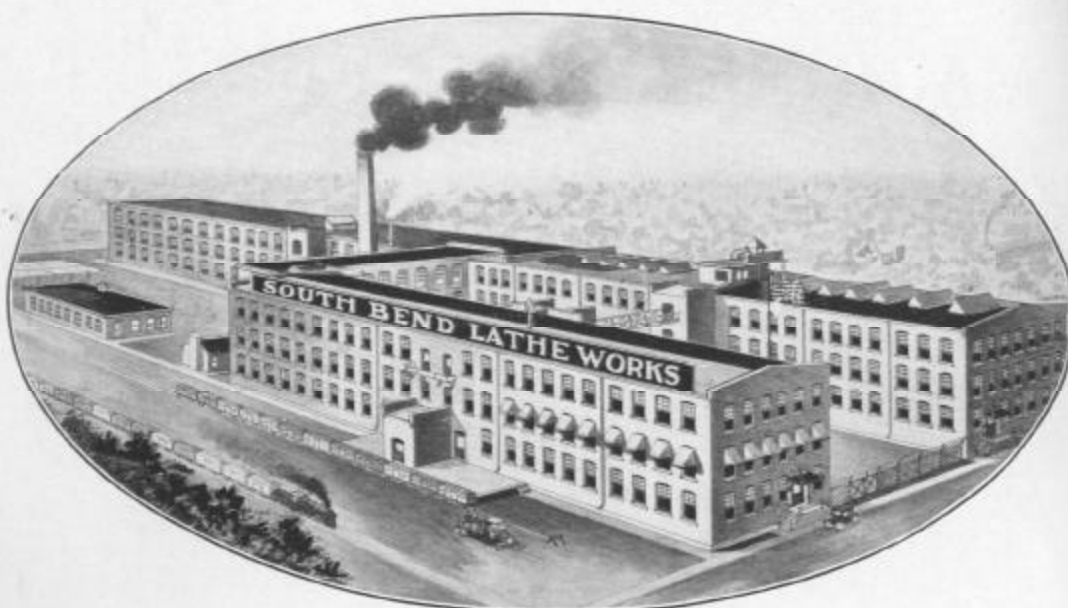
Issued in the interest of Vocational
and Industrial training in the School

Copyright 1920 by
O'BRIEN BROTHERS
J. J. O'Brien M. W. O'Brien

SOUTH BEND LATHE WORKS

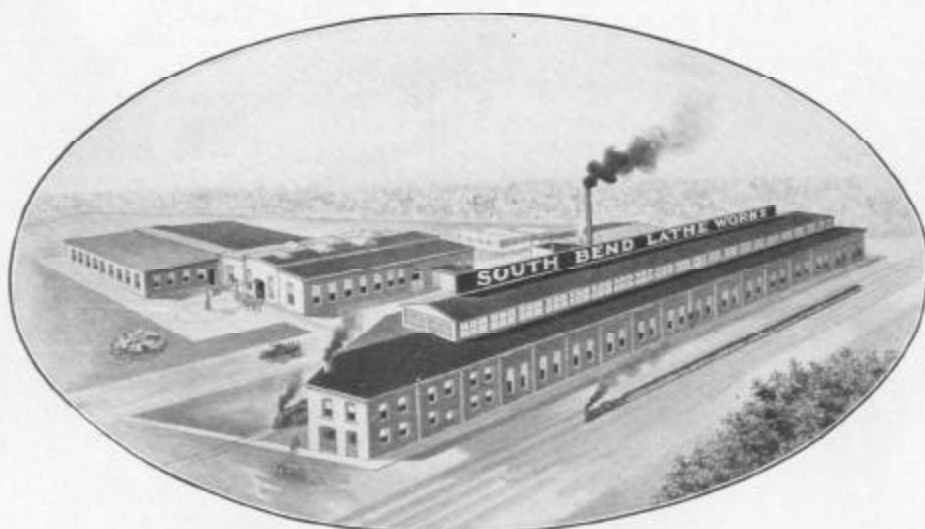
425 E. MADISON ST.

SOUTH BEND, IND., U. S. A.



East Madison Street Plant, South Bend, Indiana

More than 22,000 South Bend Lathes in Use



Fellows Street Plant, South Bend

The South Bend Lathe Works was Established in 1906

THE SCHOOL MACHINE SHOP

This booklet contains 40 illustrations of school machine shops located throughout the United States and Canada. These views were taken from actual photographs in each shop. They will give an idea of what some of the practical school shops are doing in Vocational and Industrial training. It is generally estimated that there are perhaps between twelve and fifteen hundred schools in the United States that are equipped and operating machine shops, varying in size from one Lathe to a \$500,000 installation. You will note that most of the school shops illustrated have the overhead countershaft drive. This is simple, practical and is the method used in most of the machine shops and industrial plants and it is a method that we recommend. We trust that these pictures will interest the supervisor and instructor, as many practical ideas may be gathered on the arrangement of equipment, installation, etc.

In this booklet we show some of the smaller, as well as some of the larger schools. Many small schools can start a little shop to take care

of a few boys even if that shop has only one lathe, a vise, a forge and a bench. With this equipment a half dozen boys can be taken care of to advantage, at least until they become trained workers, so that when they do leave for the big city they will leave as trained skilled young men, and know definitely what line of work they wish to follow.

Most boys should learn a trade in order that they may become skilled workmen. The trained workman is always in demand. The machinist trade offers the best opportunity, because there are more men employed as machinists than in any other trade. The work is interesting, the wages high, and the opportunities for advancement good. When a boy has learned a trade, becomes a skilled mechanic, he has an excellent equipment with which to begin life's battle, but he need not stop there. George Westinghouse, the Wright Brothers, Henry Ford, and the Studebaker Brothers were mechanics, and it was their mechanical training that made their success possible.

THE GOLDEN HOURS

From "THE SPHINX TALKS"

You fathers, do you ever stop to think that your boy's time is as valuable as yours? That sounds like a joke, doesn't it, as you watch him waste the hours in doing nothing, waiting to grow up; and then as you compare his life with the busy-crammed hours of yours, that keeps the family stocking full.

But it's true, nevertheless. All time in any one man's life is of equal value. The hour you waste as a boy you must make up as a man, or else fall short of your achievement. See, here is the proof.

You will accomplish a certain amount of work in your life, and you have a definite number of hours in which to do it. So any wasted hours will only result in less work accomplished when the end comes, no matter where you waste them. Is the value of the time affected? Not at all.

The big mistake almost the whole world makes is to think a boy's time valueless, and a man's time valuable. The common belief is that a boy must wait until he has been comparatively idle for eighteen years or so, before he begins the real work of his life. He must "grow up" first, going to school in a perfunctory fashion and then begin doing things of value. That's wrong.

From the very start, the boy's time is as valuable as a man's and should be used as carefully. Of course the boy's occupations must be less difficult, and directed toward a different end.

Much time in early life must be devoted to physical activity, to play, to growth, to learning the fundamental things. But let us use these precious hours wisely, so that they shall really be of value. Let us direct the play hours for real development, let us train practically, and build efficiently. Away with waste. No more idleness.

You can't get away from the gospel that success depends upon what you do with your time—not only when you are grown up, but when you are a boy. Why is one man's hour worth 25 cents and another man's a hundred dollars? Because the latter is efficient, and the former is not. What is efficiency? The result of training, much more than of inborn ability. And how do we get training? By wisely using time. Time is the most inexorable thing in the world. The wasted hour can never be regained. There are only a certain number of hours in life, infinitely precious, set as a time limit for achievement.

Machine Shop Equipment Required for a School

What equipment is most suitable for a school machine shop in a city of ——— population, is a general question that we are asked by educators. To answer these questions and many others, we list five Standard Machine Shop Equipments in this booklet, indicating the style and size of the equipment that is most practical.

The size of the equipment is governed by the number of boys that are to be taken care of.

The prices shown for the five Standard Machine Shop Equipments are only approximate. We manufacture the lathes only, as our entire plant is devoted exclusively to the manufacture of lathes. All other machines and supplies listed in the equipments may be purchased direct from the various manufacturers and machinery dealers.

If you intend to put in equipment and wish circulars illustrating and describing drill presses, shapers, milling machines, etc., which we do not make we will be pleased to send you this information and the name of the makers, so that you can buy direct.

We recommend the No. 37-C, 15" x 6' South Bend Lathe as being the most practical size for the school shop. It is the popular School Lathe because it is most suitable for the work. This Lathe is illustrated and described on pages 58 and 59, the prices are also given.

On pages 60 and 61 will be found the illustration, description and prices of our entire line. These prices are net list to schools f. o. b. South Bend.

On pages 8, 9, 10 and 11 will be found listed standard equipments Nos. 1, 2, 3, 4 and 5. These equipments have been selected after carefully going over the field and consulting experienced machine shop supervisors and instructors as to what was the most desirable and practical equipment to take care of a certain number of boys.

A copy of this book, "Machine Shop Equipment," will be mailed free upon request, to any educator. Give your street and number to insure delivery.

Shop Equipment

In specifying machine shop equipment we have not given preference to or recommended any particular make tool other than the Lathe, but if you are interested and ask our advice about any make of tool or machine we will be glad to give you the information you desire.

As manufacturers and engineers, we have been interested for more than twelve years in the industrial schools which train young workers for the machine shop. We have visited more than two hundred of the most progressive school shops in the country, studied their requirements, and noted their efficiency. During that time we have been constantly training boys in our own shop to become machinists.

We have had a great deal of experience in selecting equipment for Vocational and Industrial Schools, as well as giving advice for its installation. We have found that occasionally mistakes have been made, where high priced, automatic machinery, intended only for intensive manufacturing, has been purchased for the school shops. However, we are pleased to add, that instructors have become aware of this ten-

dency, and are now recommending that school shops be equipped with more sensible, practical and simple machinery, similar to that found in commercial machine shops. This does justice to the boys and to the taxpayer as well, in that more machines can be purchased for less expenditure, more boys given the needed training and public funds used for more practical purposes.

Selecting Equipment

If in doubt about the size of an equipment to take care of a certain number of boys, write us and we will tell you how other schools are equipped for handling the number of boys you wish to care for.

LATHE CATALOG No. 60

All Lathes, Tools and Accessories, including Chucks and other Attachments that are shown in this book are fully illustrated, described and priced in our General Catalog, describing South Bend Lathes. A copy of this catalog will be mailed, postpaid, free to any address. Give your street and number to insure delivery.

Standard Equipment No. 1

\$800 to \$1000. Equipment for the Small School Shop

- 1—Engine Lathe, 15" swing by 6' bed.
- 1—8" x $\frac{3}{4}$ " Tool Room Grinder with column.
- 1—2 H. P. Electric Motor.
- 10 ft.—1 $\frac{1}{2}$ " Shafting, two Hangers, Belting and Pulleys.
- 1—8" 4-jaw Independent Chuck.
- 1 Each—Patent Straight, Right-hand and Left-hand Turning Tools.
- 1 Each—Patent Right-hand, Left-hand, Side Tool, Straight cut-off and Threading Tool.
- 1—Drill Chuck, 0 to $\frac{3}{4}$ ".
- 1—Set Straight Twist Drills, $\frac{1}{16}$ to $\frac{3}{4}$ ", in 16ths.
- 1—Vise, 4 $\frac{1}{2}$ " jaw.
- 1—10" Adjustable Hand Hack Saw Frame.
- 1—B. P. Machinist Hammer, 1 $\frac{1}{2}$ lbs.
- $\frac{1}{2}$ dozen Files—Assorted.
- 1— $\frac{3}{4}$ " Lathe Dog.
- 1—1 $\frac{1}{4}$ " Lathe Dog.
- 1—2" Lathe Dog.

The 15" Lathe that is specified in the five Standard Equipments is illustrated and described on pages 58 and 59 of this book. A more complete description will be found in our catalog, No. 60, which will be mailed free on request.

Standard Equipment No. 2

\$1,200 to \$1,500. Equipment for the Vocational School Machine Shop, to Take Care of Twenty-four Boys Annually in Vocational and Industrial School Courses

- 2—Engine Lathes, 15" swing by 6' bed.
- 1—20" Back Gear Power Feed Drill Press.
- 1—8" x $\frac{3}{4}$ " Tool Grinder, Column and Water Pot.
- 1—Power Hack Saw.
- 1—3 H. P. Electric Motor.
- 20 ft.—1 $\frac{1}{2}$ " Shafting, four Hangers, Belting (double ply) and Pulleys.
- 1—10" Independ't 4-jaw Chuck (reversible jaws)
- 1—8" Universal 3-jaw Chuck (reversible jaws).
- 2 each—Patent Straight, Right-hand, Left-hand Turning Tools.
- 2—Patent Right-hand Side Tools.
- 1 each—Patent Left-hand Side Tool, Straight Cut-off, Right-hand Cut-off, Threading Tool, Small Boring Tool, Large Boring Tool.
- 1—Drill Chuck, 0 to $\frac{3}{4}$ ".
- 1—Set Straight Twist Drills, $\frac{1}{16}$ to $\frac{3}{4}$ ", in 32nds.
- 1—Vise, 4 $\frac{1}{2}$ " jaw.
- 1—12" Adjustable Hand Hack Saw Frame.
- 2—B. P. Machinist Hammers, 1 $\frac{1}{2}$ lb.
- 1—B. P. Machinist Hammer, 12 oz.
- 1—Dozen Files, assorted.
- 2— $\frac{3}{4}$ " Lathe Dogs.
- 2—1 $\frac{1}{4}$ " Lathe Dogs.
- 2—2" Lathe Dogs.

Standard Equipment No. 3

\$3,000 to \$3,500. Equipment for the Vocational School Machine Shop, to Take Care of Forty-four Boys Annually in Vocational and Industrial School Classes

- 4—Engine Lathes, 15" swing by 6' bed.
- 1—14" Metal Working Shaper (swivel vise).
- 1—20" B. G. P. F. Drill Press.
- 1—15" Sensitive Drill Press.
- 1—12" Tool Grinder.
- 1—Power Hack Saw.
- 1—5 H. P. Electric Motor.
- 20 ft.—1½" Shafting, 4 Hangers, Belting (double ply) and Pulleys.
- 4—10" Independent 4-jaw Chuck (reversible jaws).
- 1—9" Universal 3-jaw Chuck (2 sets of jaws).
- 5—Patent Straight Turning Tools.
- 4 each—Patent Right-hand and Left-hand Side Tools.
- 3—Patent Right-hand Cut-off Tools.
- 2—Patent Straight Cut-off Tools.
- 2 each—Patent Small and Large Boring Tools.
- 1—Drill Chuck, 0 to ½".
- 1—Drill Chuck, 0 to ¾".

- 1—Set Straight Twist Drills, ⅜ to 1" in 32nds.
- 2—Vises, 4 ½" jaw (swivel).
- 1—Vise, 5" jaw.
- 1—10" Adjustable Hand Hack Saw Frame.
- 4—B. P. Machinist Hammers, 1 ½ lb.
- 1—C. P. Machinist Hammer, 1 ½ lbs.
- 1—S. P. Machinist Hammer, 1 ½ lb.
- 1—B. P. Machinist Hammer, 12 oz.
- 2—Dozen Files, assorted.
- 1—Set Lathe Dogs, ⅜" to 2".

EQUIPMENT FOR VOCATIONAL, INDUSTRIAL AND MANUAL TRAINING WORK IN THE MACHINE SHOP

The number of boys that can be taken care of in the machine shop differs according to the course taken. For example, the standard machine shop equipment No. 3 will take care of forty-four boys annually in the Vocational School. The same equipment will take care of sixty boys as an Industrial School and will take care of one hundred and fifty boys yearly as a Manual Training School.

Standard Equipment No. 4

\$8,000 to \$10,000. Equipment for the Vocational School Machine Shop, to Take Care of Sixty-six Boys Annually in Vocational and Industrial School Classes

- 6—Engine Lathes, 15" swing by 6' bed.
- 1—16" Metal Shaper (swivel vise).
- 1—No. 1 Universal Milling Machine.
- 1—24" x 24" x 6' Metal Planer, with 18" Planer Chuck.
- 1—20" B. G. P. F. Drill Press.
- 1—15" Sensitive Drill Press.
- 1—Power Hack Saw No. 1.
- 1—12" Tool Grinder.
- 1—10 H. P. Electric Motor.
- 28 ft.—1½" Shafting—Hangers, Couplings, Pulleys and Belt (double ply).
- 6—10" Independent 4-jaw Chucks (reversible jaws).
- 1—9" Universal 3-jaw Chuck (two sets jaws).
- 8—Patent Straight, 4 Left-hand, 2 Right-hand Turning Tools.
- 4—Patent Straight, 3 Right-hand, 2 Left-hand Cutting-off Tools.
- 4—Patent Right-hand, 2 Left-hand Side Tools.

- 2 each—Patent Small and Large Boring Tools.
- 1—Drill Chuck, 0 to ½".
- 1—Drill Chuck, 0 to ¾".
- 1—Set Straight Twist Drills, ⅜ to 1" in 32nds.
- 1—Set of Drills, 0 to No. 60.
- 4—Vises, 4 ½" jaws.
- 1—Vise, 5 ½" jaws.
- 2—10" Hack Saws.
- 6—B. P. Machinist Hammers, 1 ½ lb.
- 2—C. P. Machinist Hammers, 1 ½ lb.
- 1—S. P. Machinist Hammer, 1 ½ lb.
- 2—S. P. Machinist Hammers, 12 oz.
- 1—Set Lathe Dogs, ⅜" to 2".

PRICES AND QUOTATIONS

The prices shown herein for the five Standard Machine Shop Equipments are only approximate. If you are interested, write us specifying which standard equipment you think is most suitable to your needs, and we will send you an itemized quotation on the lathes, machines, tools and supplies so that you may know exactly just what the cost would be.

Standard Equipment No. 5

\$15,000 to \$18,000. Equipment for the Vocational School Machine Shop to Take Care of Ninety Boys Annually in Vocational and Industrial School Classes

- 10—Engine Lathes, 15" swing by 6' bed.
- 2—Engine Lathes, 18" swing by 8' bed.
- 1—24"x24"x6' Planer with Chuck (swivel base).
- 1—Universal Milling Machine with vertical attachment.
- 1—Universal Grinding Machine.
- 1—15" Shaper (swivel base vise).
- 1—20" D. C. P. F. Drill Press.
- 1—14" Combination and Dry Tool Grinder.
- 1—15" Sensitive Drill.
- 1—Arbor Press.
- 1—Power Hack Saw.
- 64 ft. of 1½" Shafting, Couplings, Hangers, Pulleys and Belting (double ply).
- 1—15 H. P. Electric Motor.

LATHE EQUIPMENT

- 10—10" Independent 4-jaw Chucks.
- 2—12" Independent 4-jaw Chucks.
- 3— 9" Universal 3-jaw Chucks.
- 12—Patent Straight, 6 Left-hand, 3 Right-hand Turning Tools.
- 10—Patent Right-hand, 2 Left-hand Side Tools.

- 8 Patent Straight Cut-offs, 3 Right-hand Cut-off Tools.
- 3—Patent Threading Tools.
- 2 each—Patent Small and Large Boring Tools.
- 1—Knurling Tool.
- 1—Set of Lathe Dogs, ¾ to 2".
- 10—B. P. Machinist Hammers, 1½ lb.
- 2—C. P. Machinist Hammers, 1½ lb.
- 2—S. P. Machinist Hammers, 1½ lb.
- 4—S. P. Machinist Hammers, 12 oz.

DRILL PRESS EQUIPMENT

- 1—Drill Chuck, 0 to ½".
- 1—Drill Chuck, 0 to ¾".
- 1—Set Straight Twist Drills, ⅜ to 1¼" in 32nds.
- 1—Set of Drills, No. 0 to No. 60.
- 1—Drill Press Vise.
- 6—Vises, 4 ¼" jaws.
- 2—10" Hack Saw Frames.
- 2—Dozen Files, assorted.

PLANER AND SHAPER EQUIPMENT

Note: Use a few tool holders in Lathe Equipment.

- 1—No. 41 Planer Tool.

MILLING MACHINE EQUIPMENT

- 1—Set Horizontal Cutters.
- 1—Set Vertical Cutters.

LAYOUT OF SMALL MACHINE SHOP

The drawings on this and opposite page illustrate a practical layout of a small school machine shop, such as listed in Standard Equipment No. 2, page 8 of this book.

The line shaft is attached to the joists about in the center of the room and parallel to the side wall. The shaft is $1\frac{1}{2}$ " in diameter and has a speed of 200 revolutions per minute. The electric motor is mounted on a bracket attached to the side wall, high enough so that the belt will not interfere with workmen passing underneath.

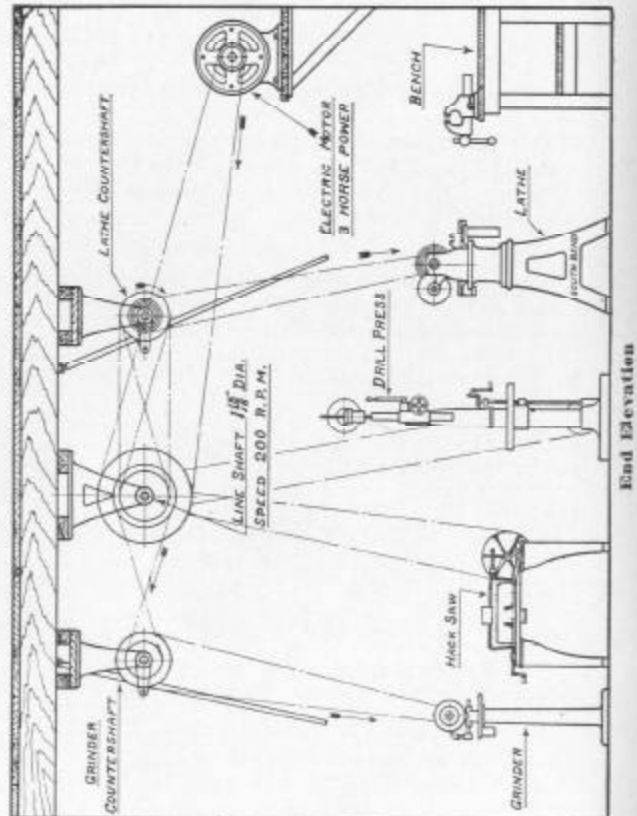
The Gas Engine shown is intended for use in towns where electric power is not available.

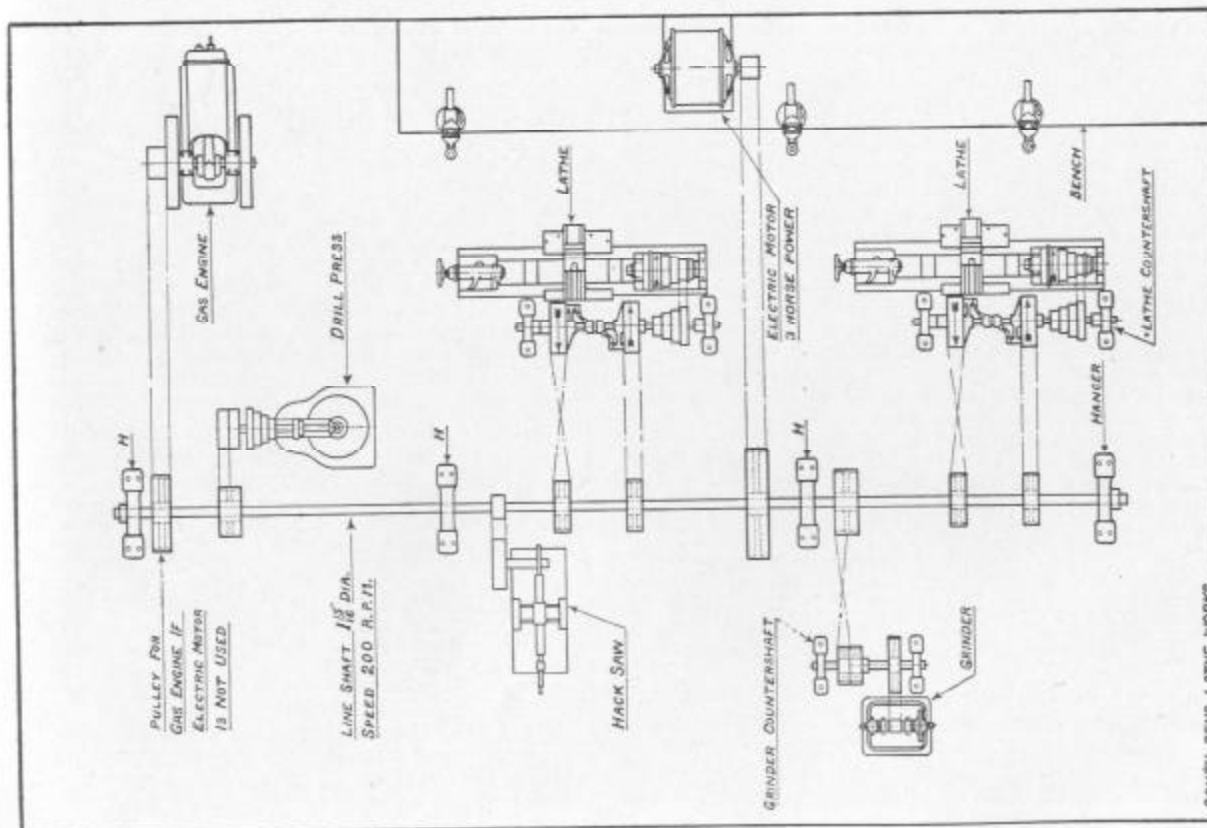
OUR MECHANICAL DEPARTMENT

(Free Service)

Write us on all questions of a technical nature. Our long experience in business, our wide range of territory and our interest in the equipment of school plants has enabled us to maintain a department for offering expert advice on all mechanical questions that may arise. If you are troubled concerning installation, power, course of instruction, projects, or anything related to machine shop operation, write to us, we make no charge for this information.

During the next ten years the United States Government will spend more than forty million dollars in the interest of Vocational Education.





Plan View of Machine Shop

SOUTH BEND LATHE WORKS

South Bend Vocational School Shop

The South Bend Vocational School Machine Shop is illustrated on page 15. This equipment and tools is our Standard Equipment No. 5, shown on page 11, with a few minor additions.

We consider this a very practical equipment. South Bend secured her school shop in this way:

The Vocational Director found that manufacturers did not have enough skilled labor and he told them that one hundred trained boys could be furnished every year if there was a practical machine shop equipment installed in the school. The manufacturers were ready to cooperate at once; they appointed a committee and together with the Vocational Director started a publicity campaign in the industries and through the Press. The Board of Education and Superintendent were in sympathy with the movement and only waited for the public demand before they should appropriate the required money. This demand soon came. A new building was erected. Approximately \$10,000 was spent for machines and tool equipment, selected by a committee of three practical men from industry. \$10,000 additional equipment had been added before the photograph was taken.

This shop has now been in operation nearly three years. It will accommodate 80 to 100 boys per year as an ordinary Manual Training or In-

dustrial School Shop is managed. However, it is an all-day vocational school and takes care of about fifty boys each day. This same equipment is used for night school and accommodates twenty-five or thirty men from industry each night and there is always a waiting list of about fifty. It is a State and Federal aided vocational school and the equipment is regarded as entirely satisfactory for turning out work on a "productive basis."

The school shop does considerable work for the manufacturers in the city. The various industries send small castings and steel parts in lots of one hundred or more to the shop to be machined. The boys work to drawings and the parts are machined in a workmanlike manner. The factories pay the school a small fee for the machine work done in school shops.

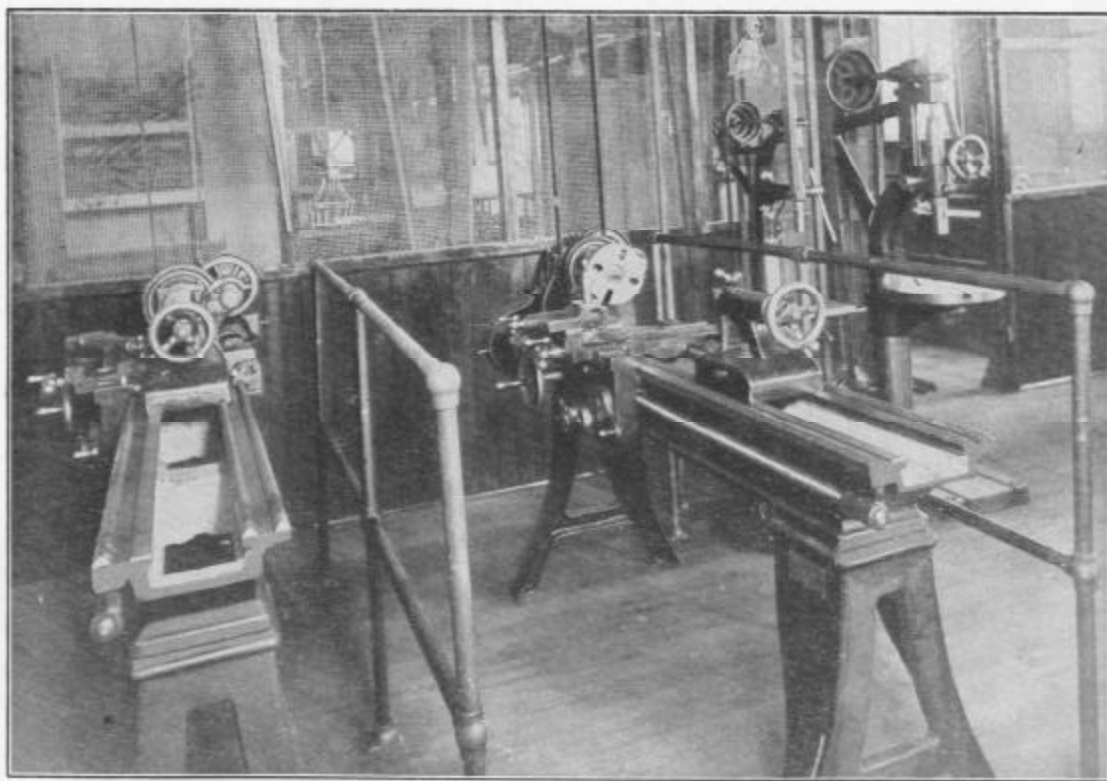
The school shop doing work for outside firms gives the boys the impression that they are assisting in the commercial industry. They also build a number of tool room grinders shown on page 63.

AUTOMOBILE REPAIR SHOP

There is also a well equipped automobile repair department connected with the school, in which a large number of young men are receiving instruction for auto mechanics. See pp. 32-33.

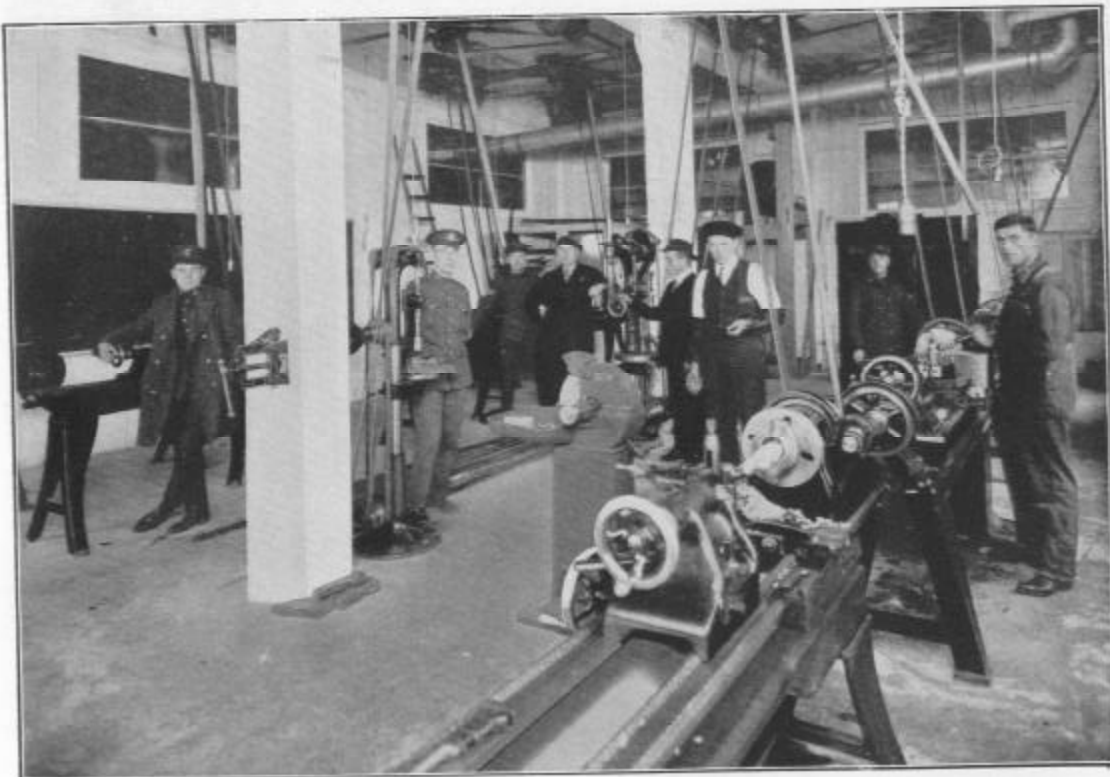


South Bend Vocational School, South Bend, Ind. (Eleven South Bend Lathes)



[16]

Manitowoc Vocational School, Manitowoc, Wis. (Three South Bend Lathes)
Population Manitowoc, 13,895



Vocational Schools, Tuxedo Hospital, Manitoba, Canada. (Seven South Bend Lathes)



School of Auto. Mechanics, Camp Mabry, University of Texas, Austin, Texas
(Twenty-three South Bend Lathes)

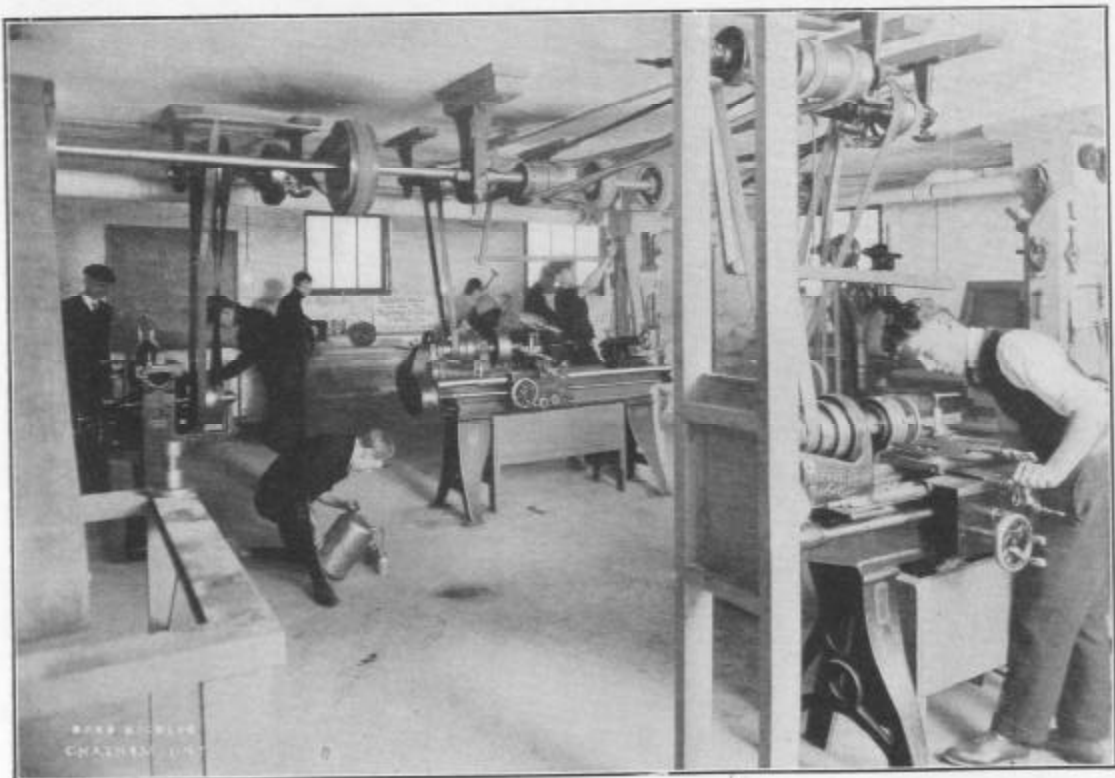


State High School, Valley City, N. D. (Four South Bend Lathes)
Population Valley City, 5,920

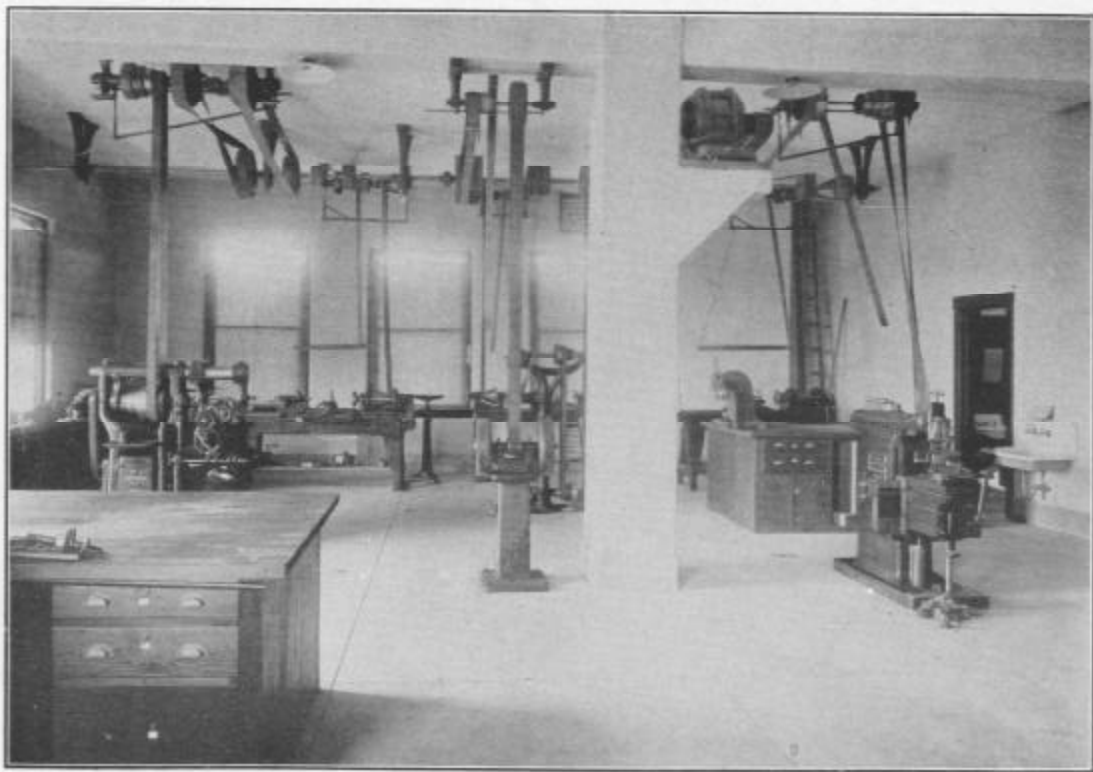


[20]

Sterling Township High School, Sterling, Ill. (Four South Bend Lathes)
Population Sterling, 10,000

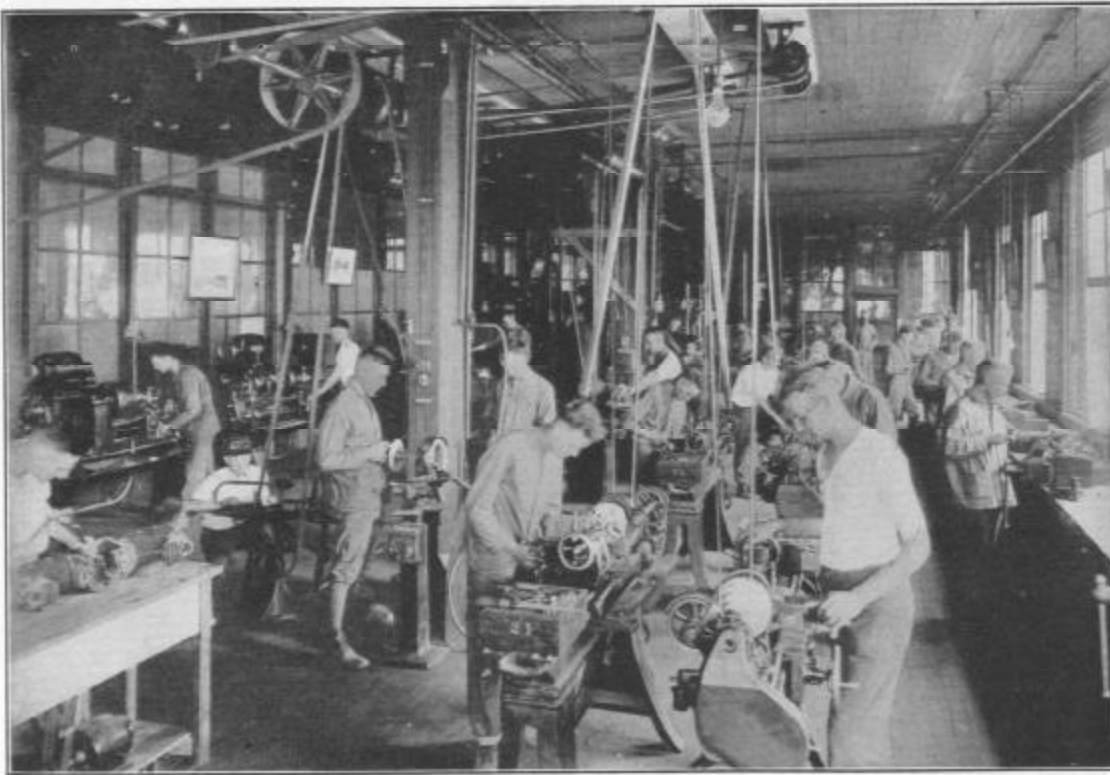


Chatham Industrial School, Chatham, Ontario, Canada

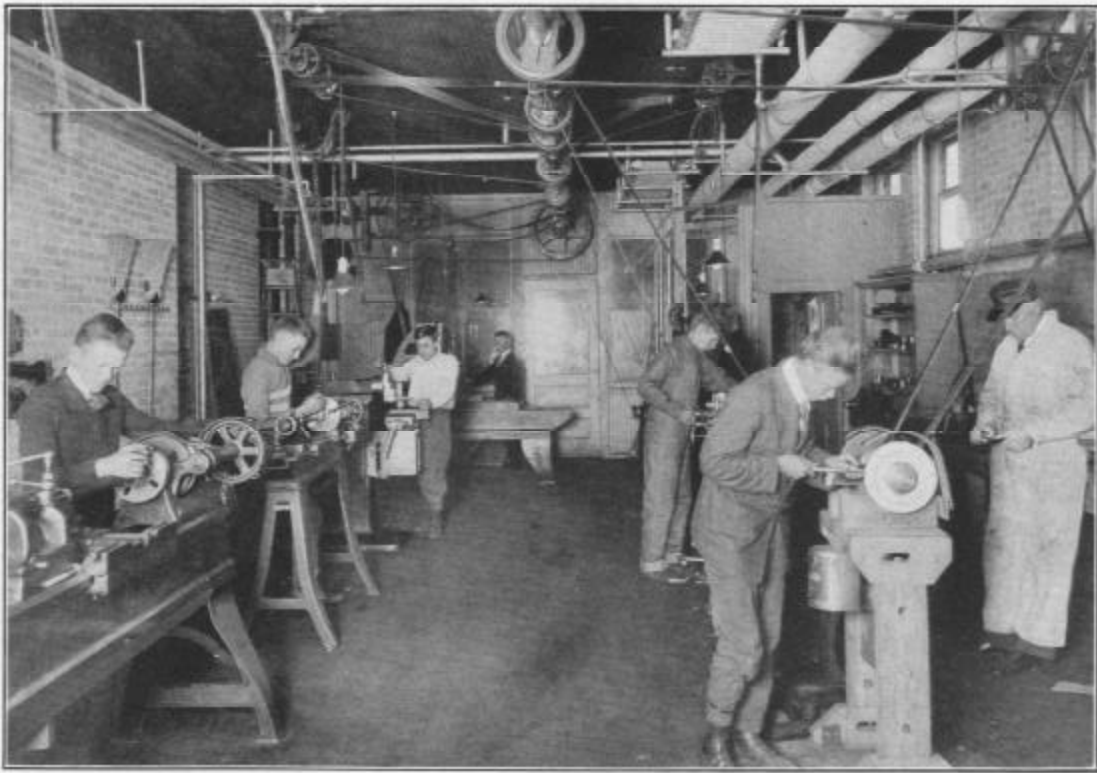


[22]

Tempe Normal School, Tempe, Arizona
Population Tempe, 1,635

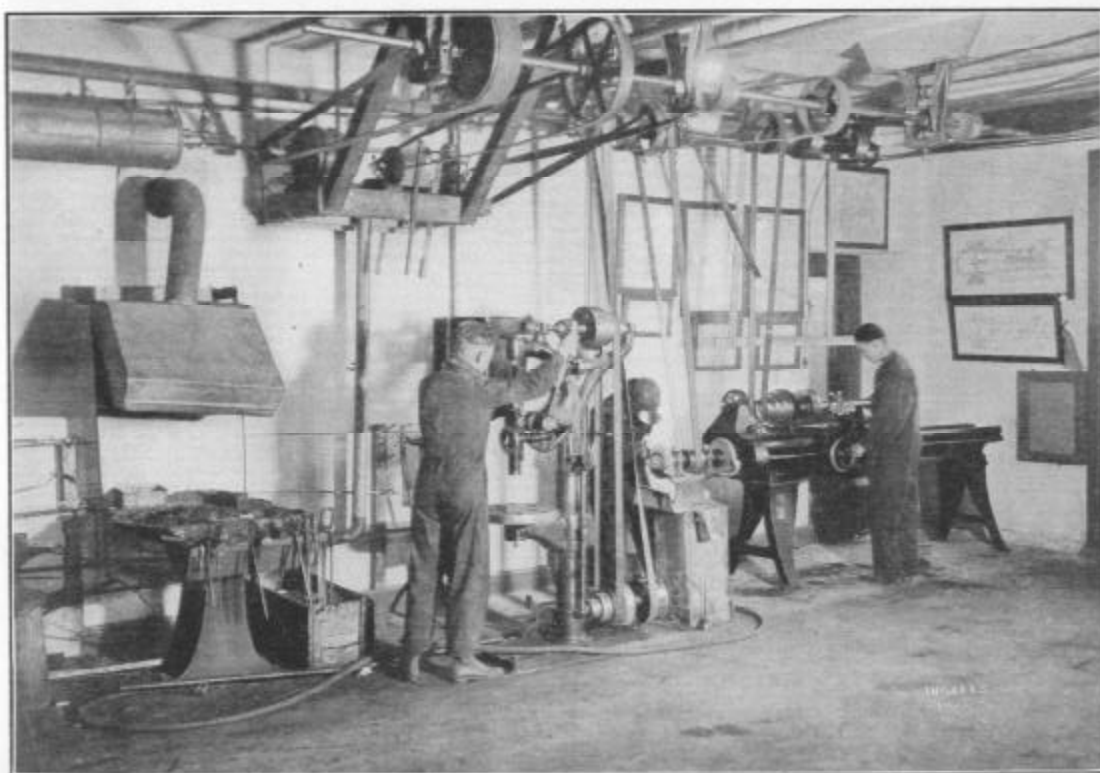


School of Mines and Metallurgy, University of Missouri, Rolla, Mo. (Four South Bend Lathes)

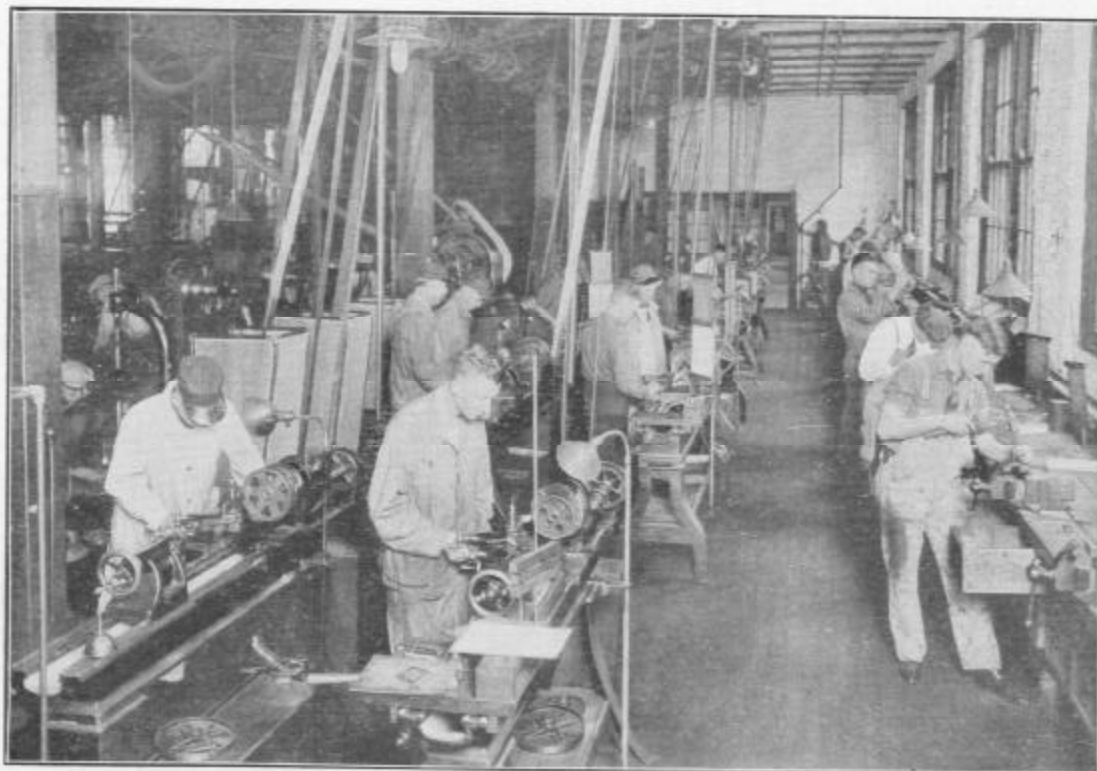


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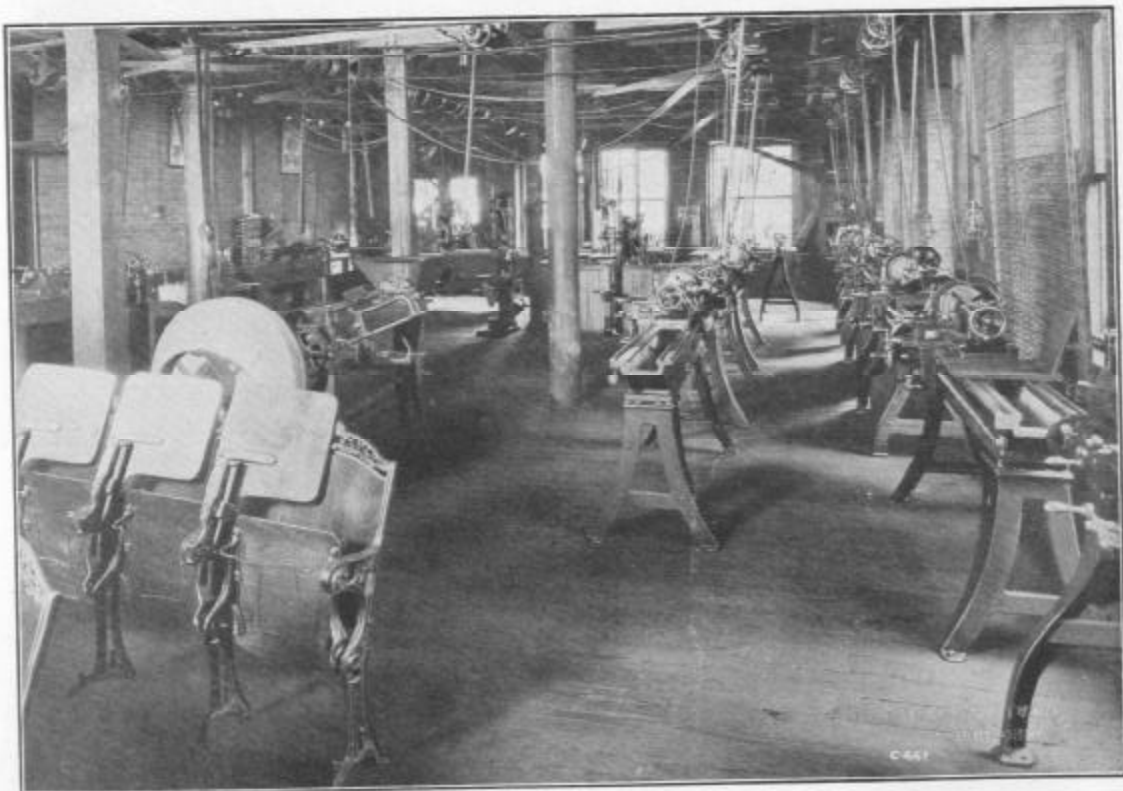
Marinette Vocational School, Marinette, Wis. (Two South Bend Lathes)
Population Marinette, 14,610



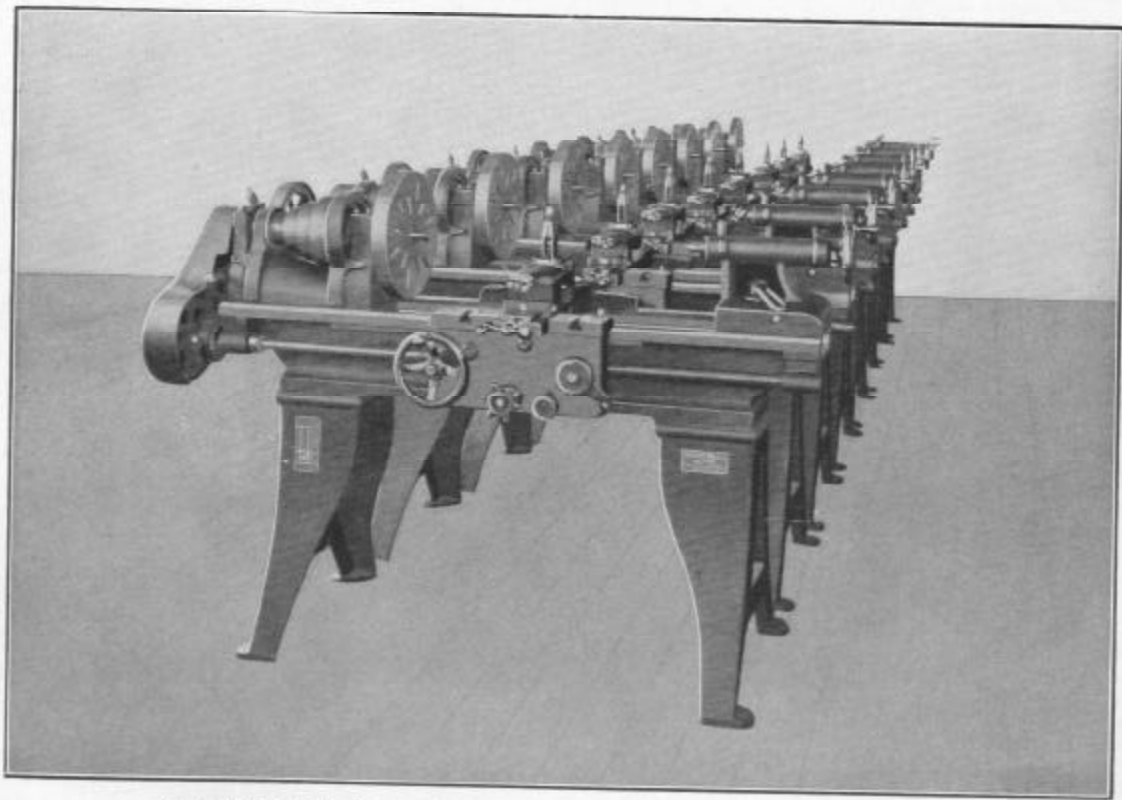
North Central High School, Spokane, Washington



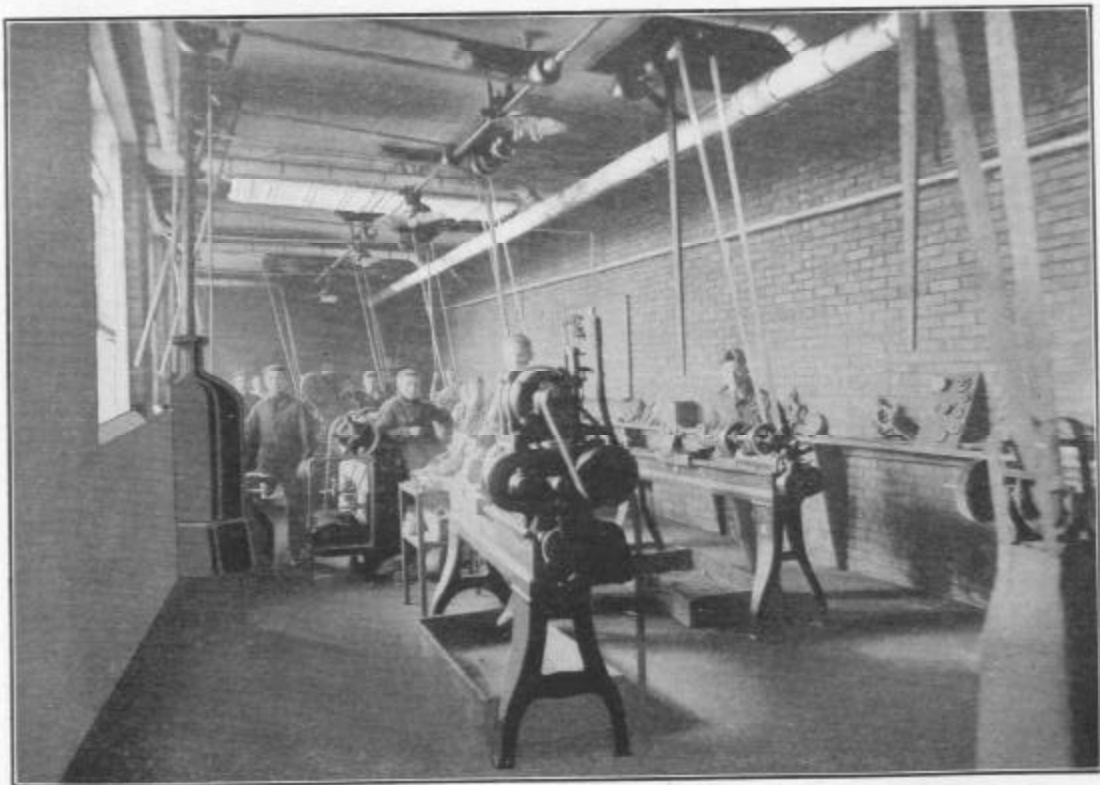
University of Kansas, Dept. Fowler Shops, Lawrence, Kansas. (Three South Bend Lathes)



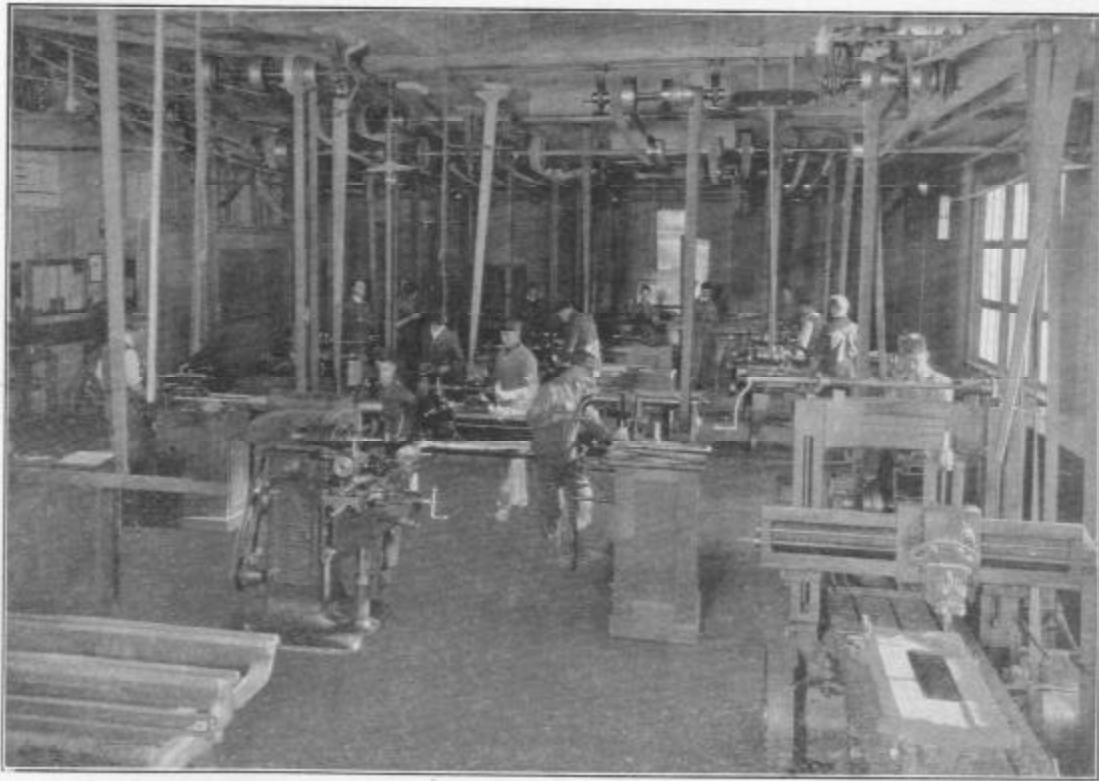
Central High School, Akron, Ohio. (Four South Bend Lathes)



U. S. Military Academy, West Point, New York. (Eight South Bend Lathes)



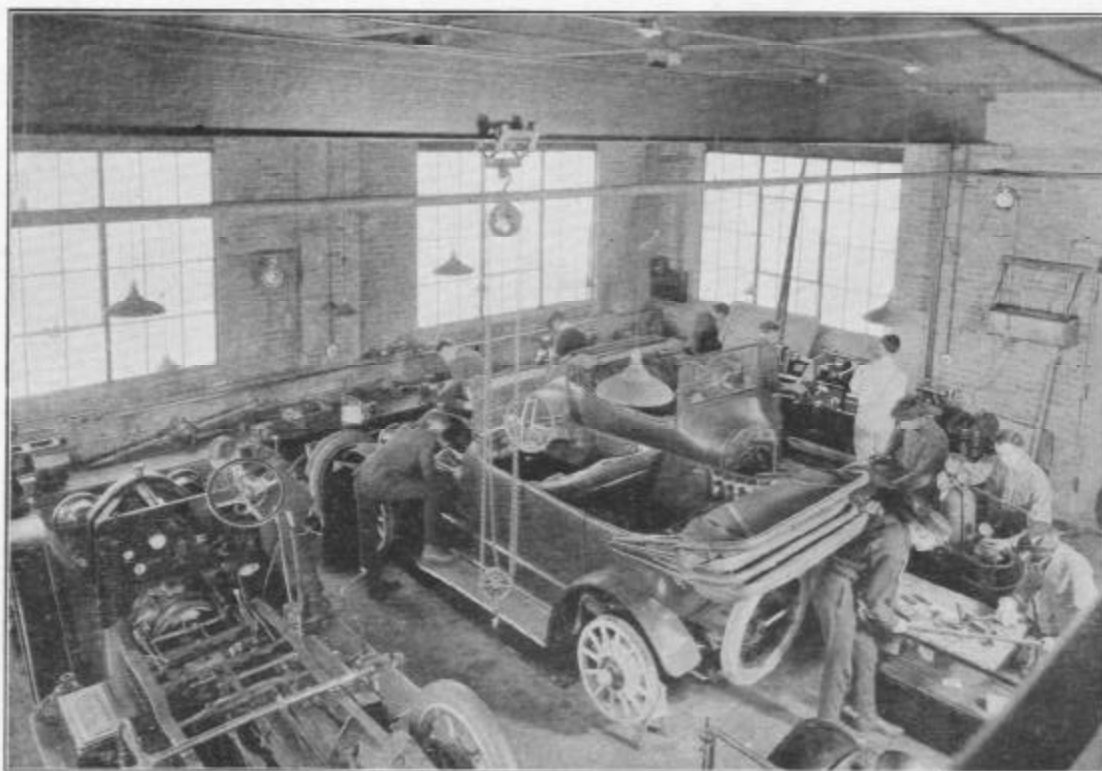
Arthur Hill Trade School, Saginaw, W. S. Michigan. (Two South Bend Lathes)



Fresno High School, Fresno, California. (Four South Bend Lathes)



William Hood Dunwoody Industrial Institute, Minneapolis, Minn. (Three South Bend Lathes)



South Bend Vocational School Automobile Repair Shop

South Bend Vocational School Automobile Repair Shop

The illustration on the opposite page shows a corner of the Automobile Repair Shop of the South Bend Vocational School. This Automobile Repair Shop was started a little over a year ago, and it has become one of the busy departments in the Industrial School work. There is a competent instructor in charge, who is familiar with all the details of the automobile repair business. This repair shop has done a great deal of work on automobiles that the ordinary garage could not attempt to do, such as straightening crank shafts, making new parts to replace those worn or broken, reboring of cylinders, making new pistons, etc. The size of the shop is 40 x 60. The equipment consists of ordinary tools such as found in the garage, a drill press and a lathe. There are three classes each day, one group of 20 in the morning, another group of 20 in the afternoon, and a group of 20 in the evening. The evening group is composed of workmen in the Industry who are taking this work as Night School.

The pupils are placed in groups of about five each for instruction purposes. One group with a student foreman works on the engine; another on vulcanizing and tire trouble; another on transmission, etc. The groups are rotated so that all cover the whole course. The work is planned for two years but is so arranged that a pupil who

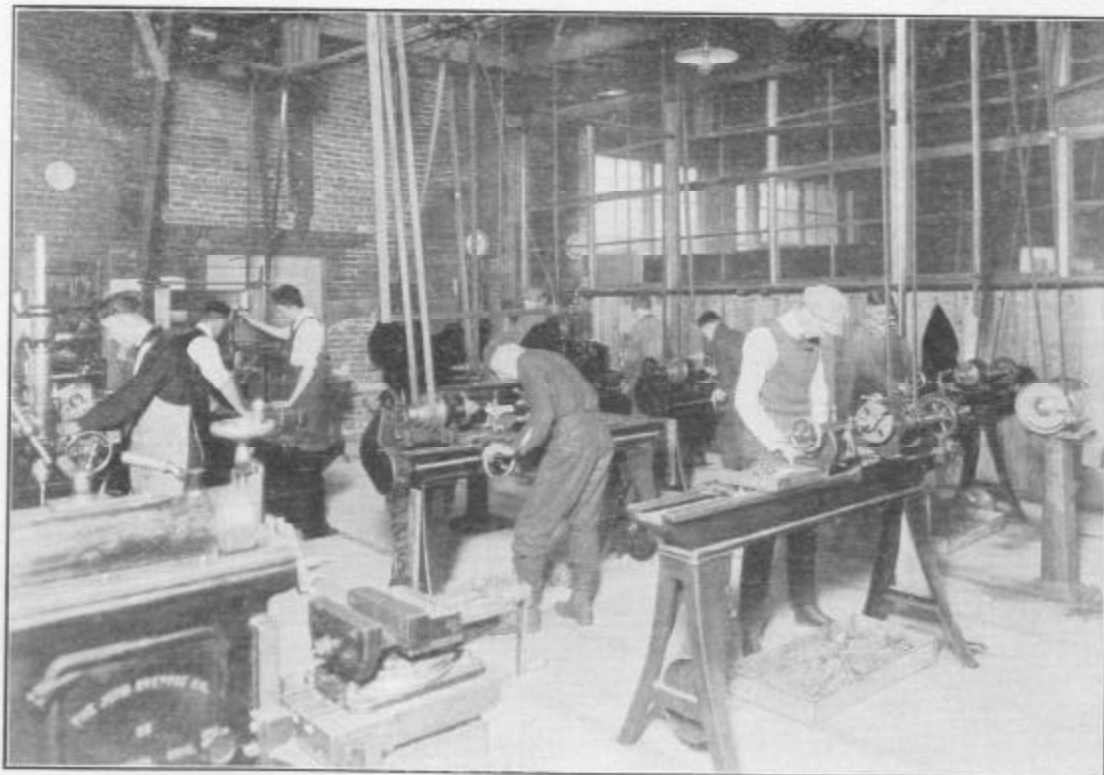
has only one year of it has gained sufficient experience to be a valuable helper about the garage.

The schools in the small town can readily start an Automobile Repair Department, because every community has automobiles that need repairing. It is estimated that there are more than 500 schools in the United States that are now operating automobile repair shops.

The South Bend school makes a small charge for the work, sufficient to cover the cost of material and supplies used, and a percentage of the overhead expense of the shop. They can take only a limited amount of work and they select only that which will be most instructive to the students. The automobile repair shop has a printed card on which they keep the time of the students while they are at work on any one job. There is also a space for keeping track of materials. Any school interested may have one of these cards on application to the South Bend Lathe Works.

SCHOOL AUTOMOBILE REPAIR SHOP

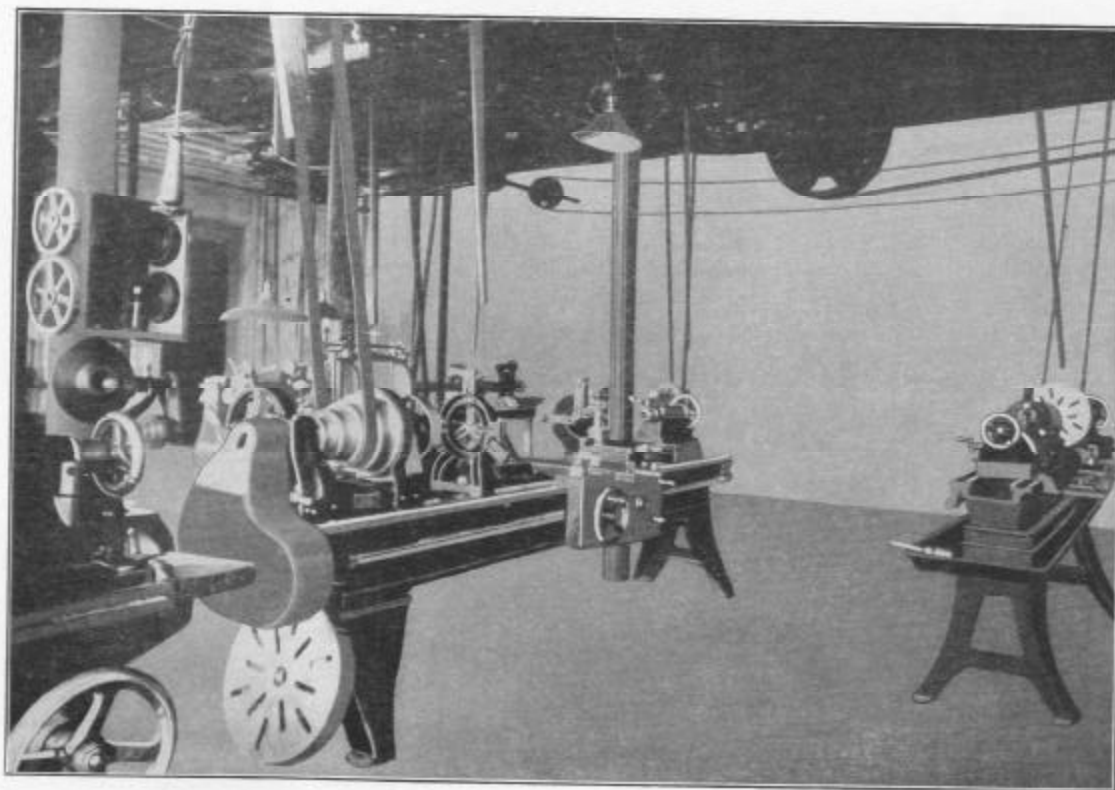
A 16-inch lathe in the auto repair equipment will take care of almost any job that comes in your shop.



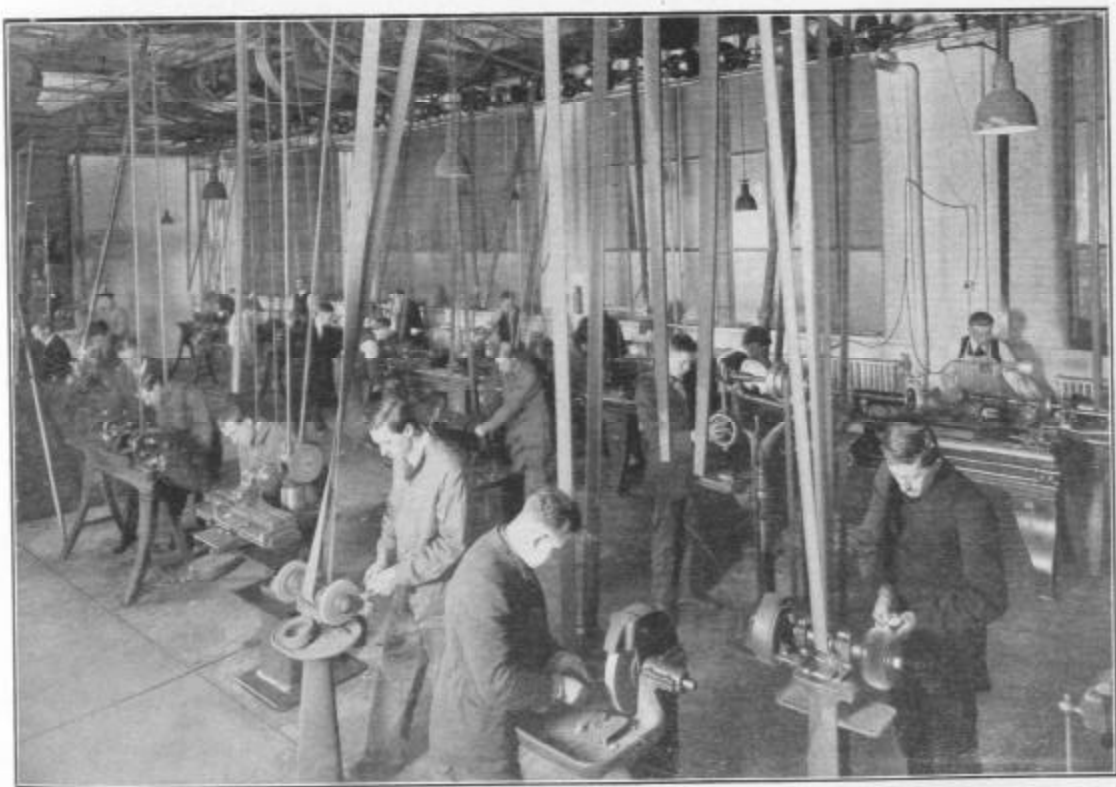
Fort Wayne Vocational School, Fort Wayne, Indiana. (Four South Bend Lathes)



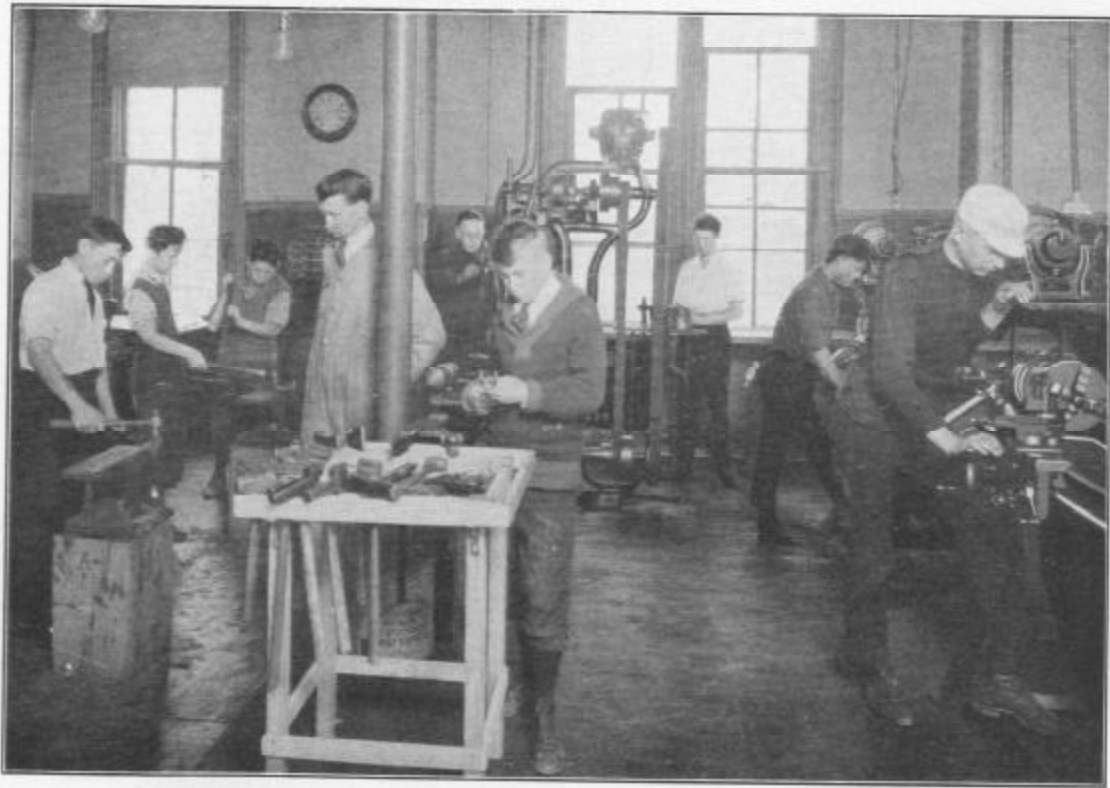
Seattle Engineering School, Seattle, Wash. (Three South Bend Lathes)



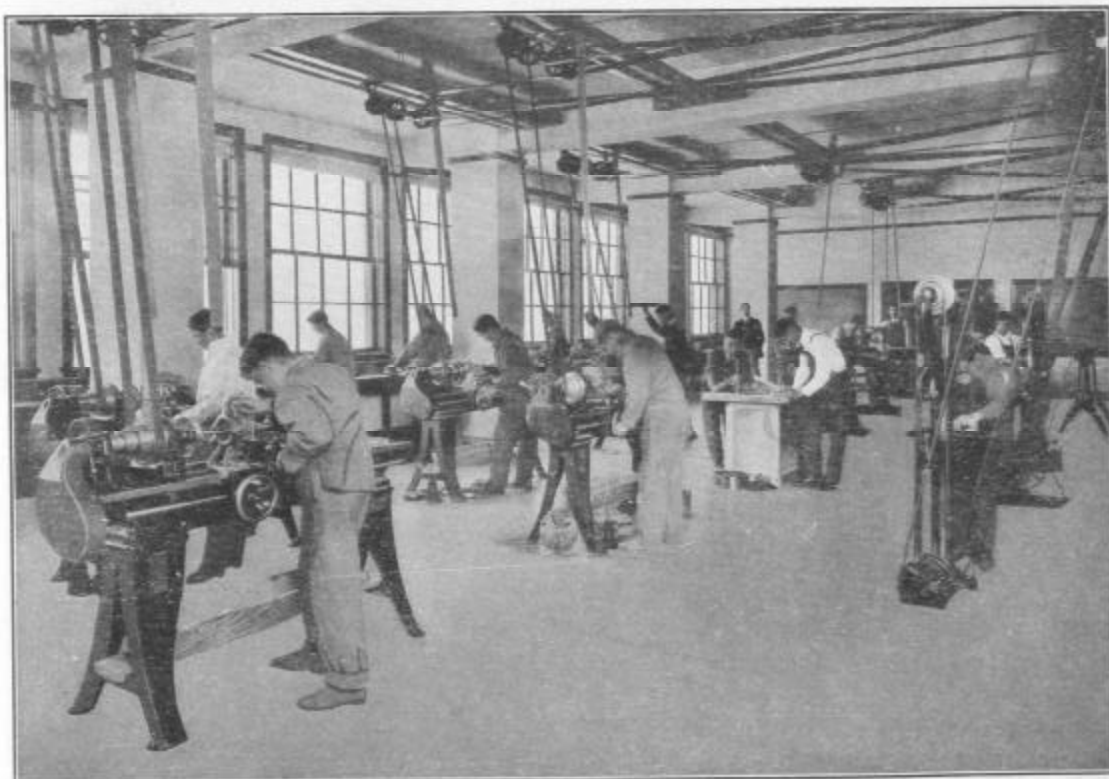
Lawrence Industrial School, Lawrence, Mass. (Two South Bend Lathes)



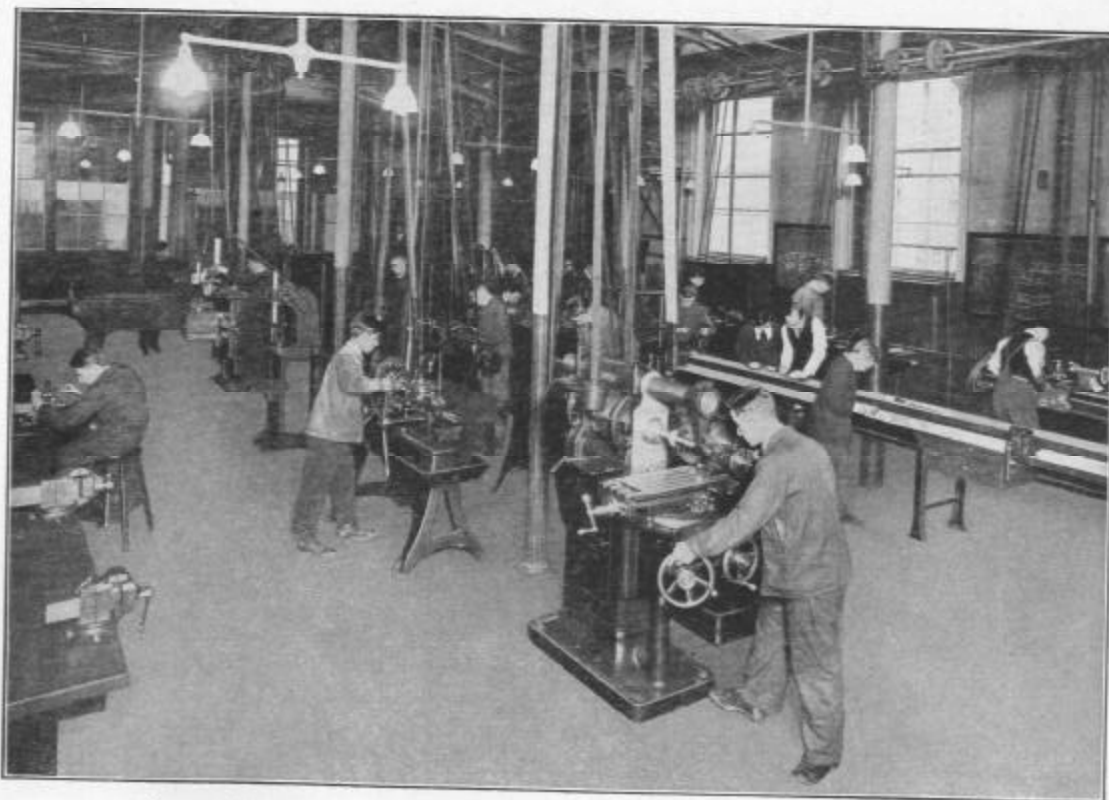
Detroit Technical Institute, Detroit, Mich. (Eleven South Bend Lathes)



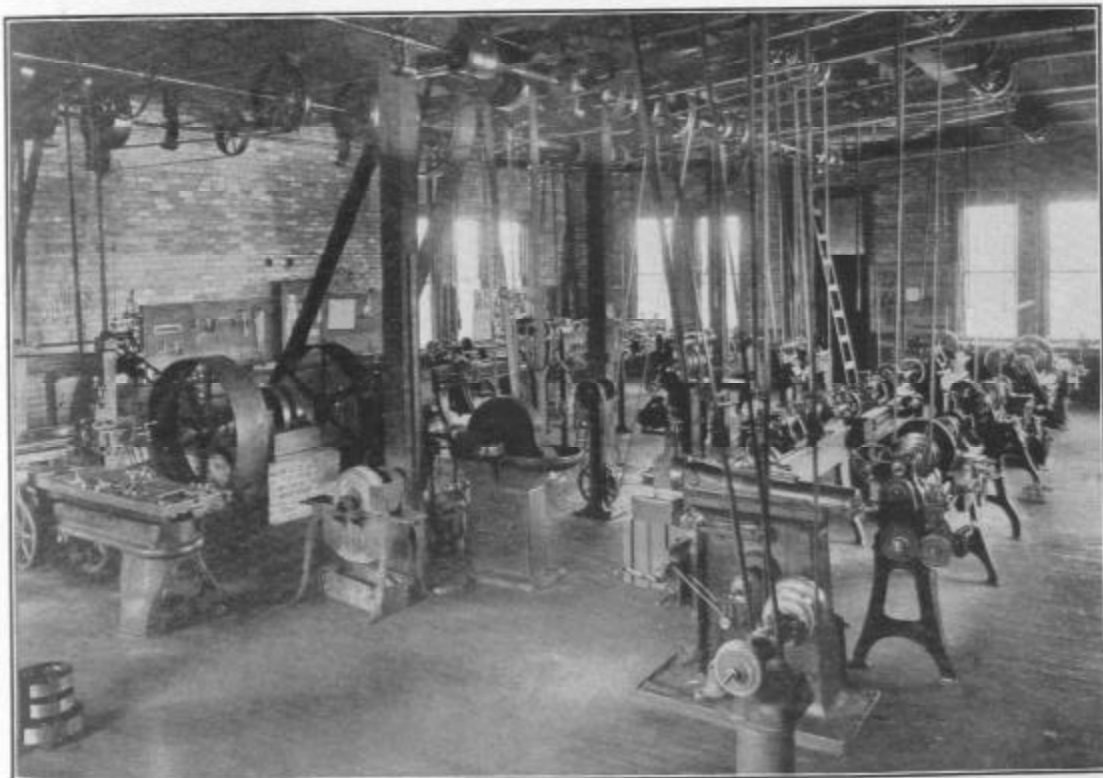
South Ionia Industrial School, Grand Rapids, Mich. (Two South Bend Lathes)



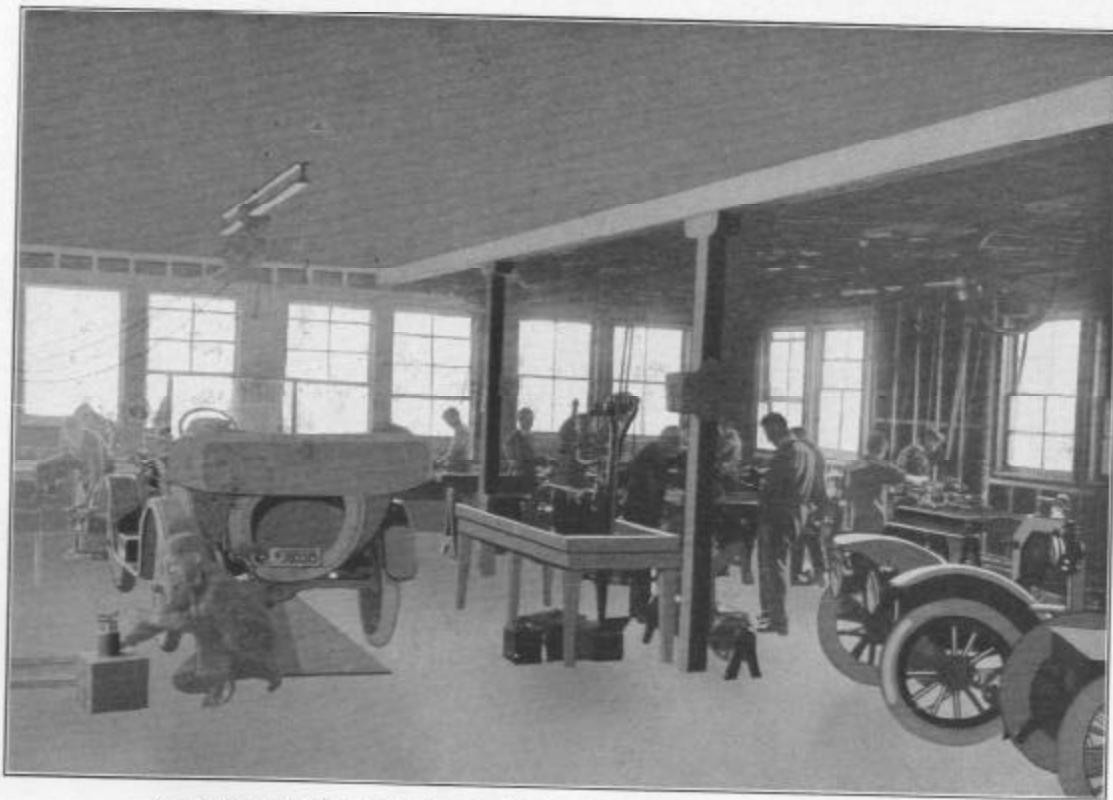
El Paso High School, El Paso, Texas. (Five South Bend Lathes)



Murray Hill Vocational School, New York City, N. Y. (Five South Bend Lathes)



South Dakota State College, Brookings, South Dakota. (Two South Bend Lathes)
Population Brookings, 3,180

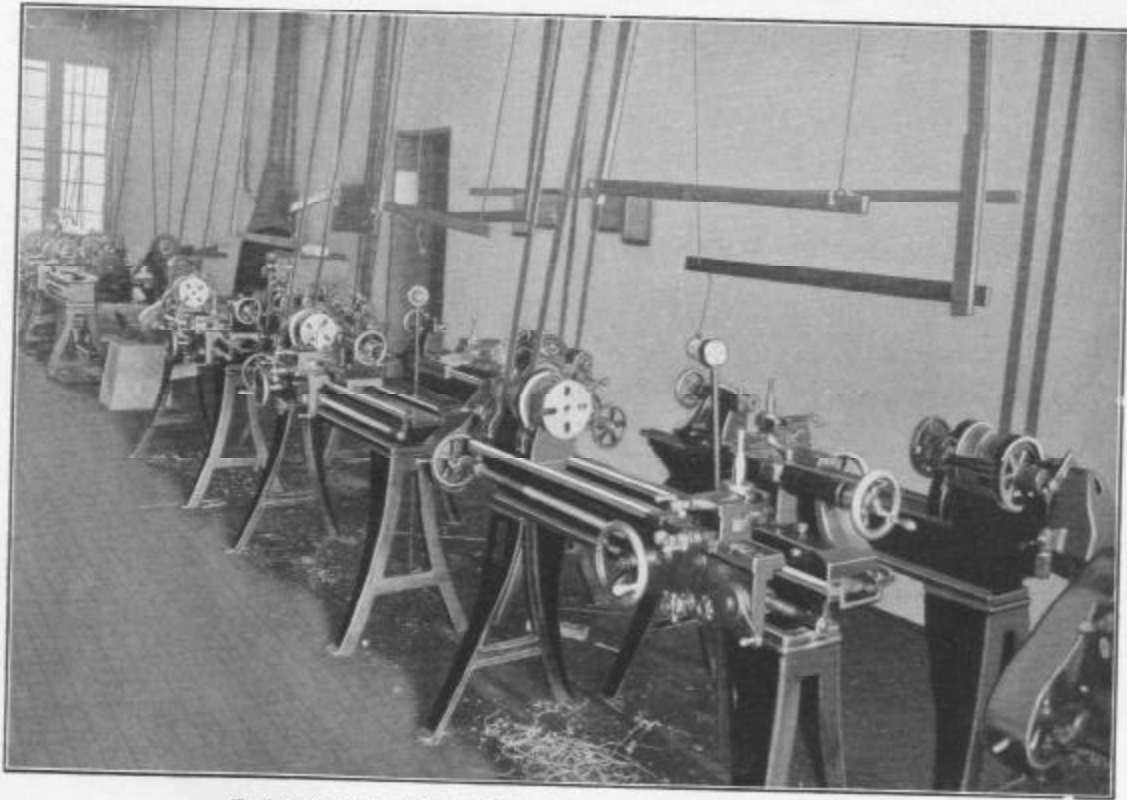


[42]

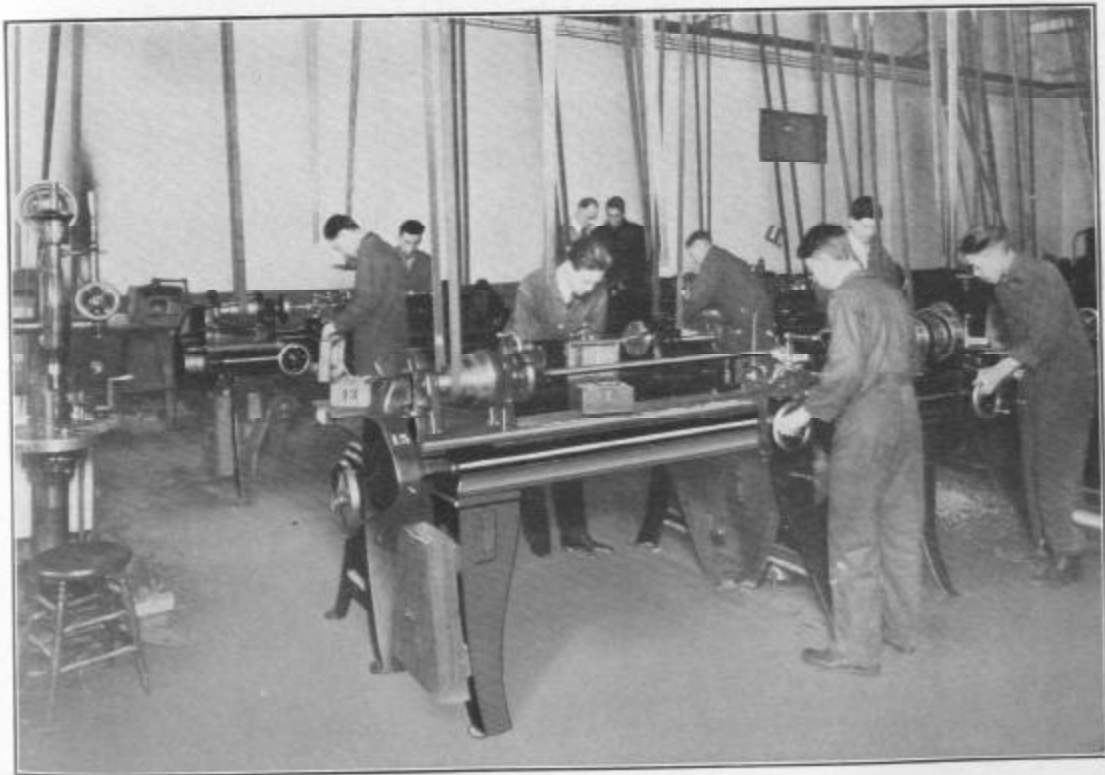
San Rafael High School, San Rafael, California. (Two South Bend Lathes)
Population San Rafael, 7,650



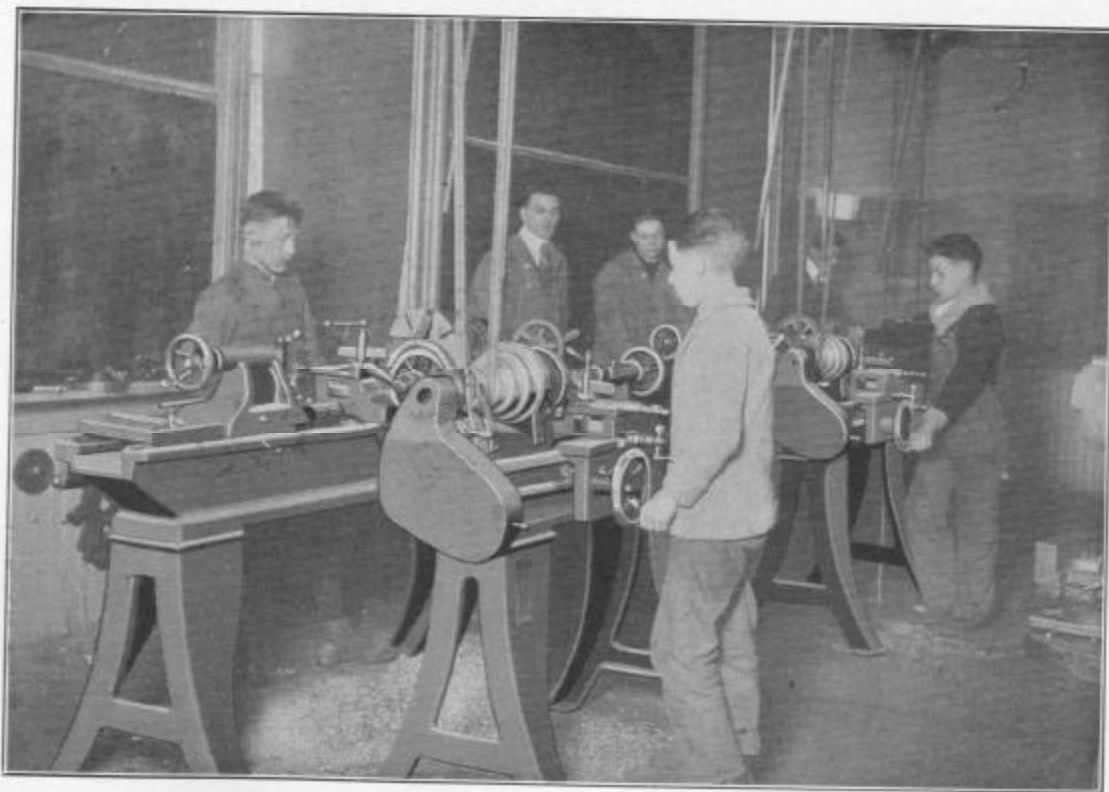
Lattimer Junior High School, Pittsburgh, Pa. (Eight South Bend Lathes)



Technical High School, Atlanta, Ga. (Ten South Bend Lathes)



Lakewood School, Lakewood, Ohio, (Eight South Bend Lathes)
Population Lakewood, 22,615

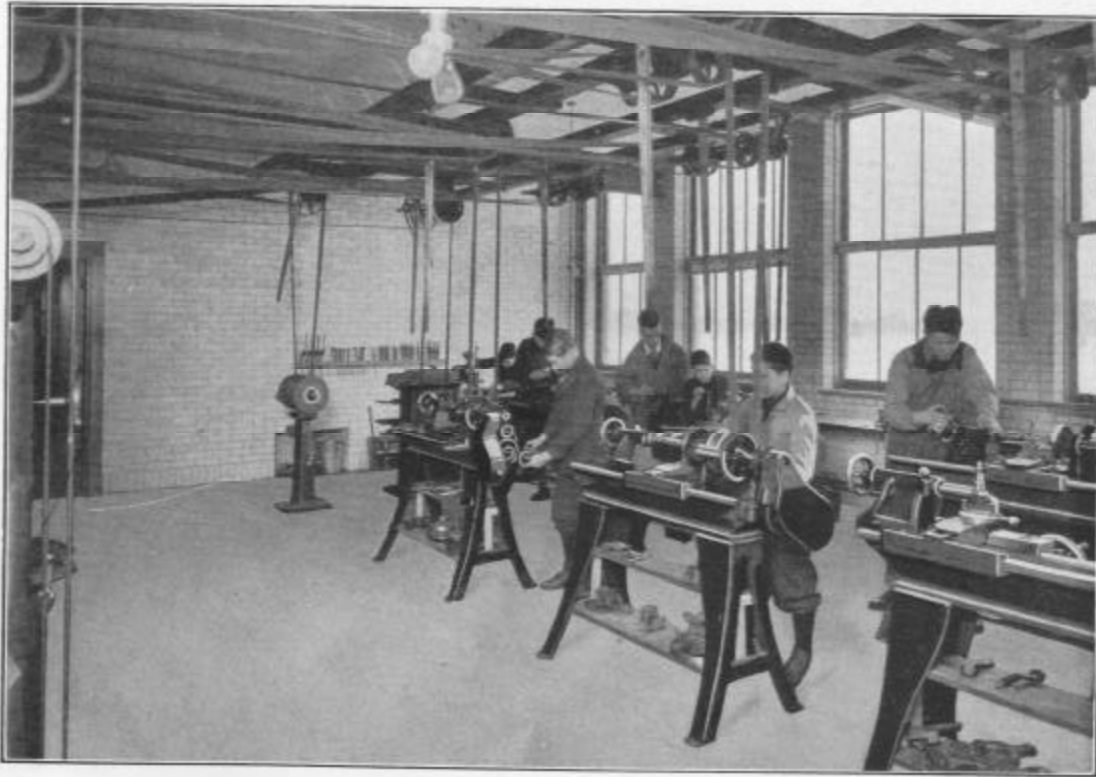


[46]

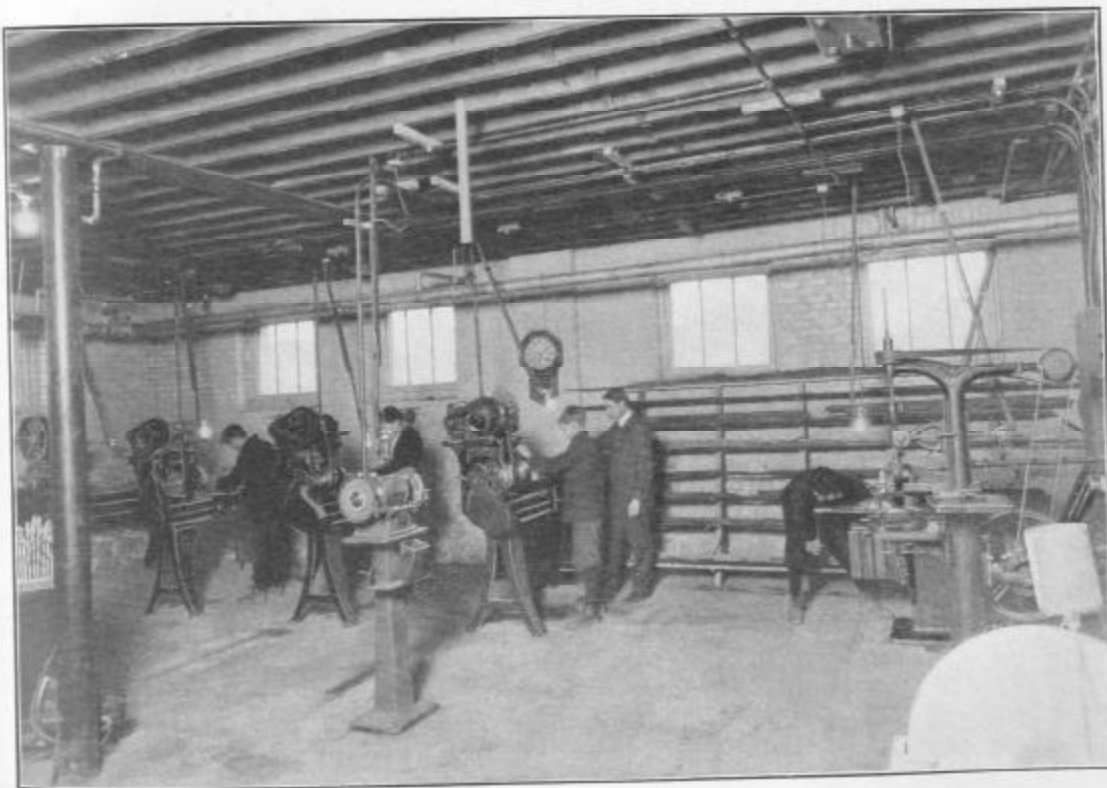
Janesville Vocational School, Janesville, Wisc. (Five South Bend Lathes)
Population Janesville, 14,339



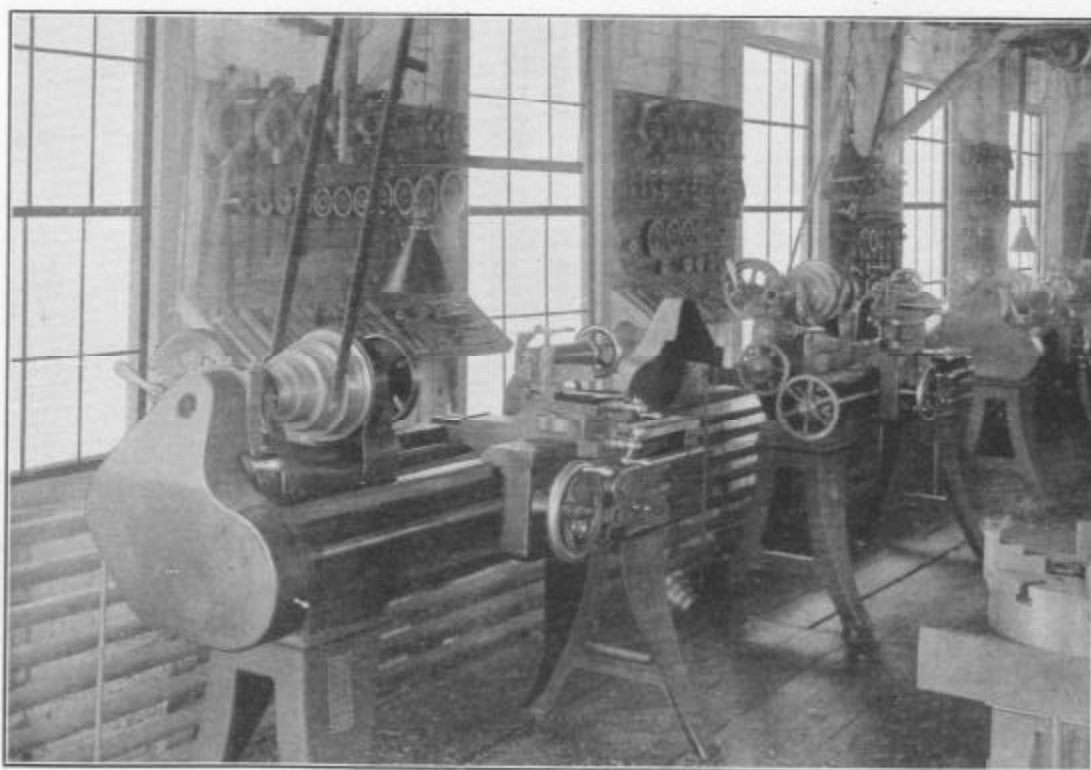
Salem High School, Salem, Ore. (Four South Bend Lathes)
Population Salem, 20,278

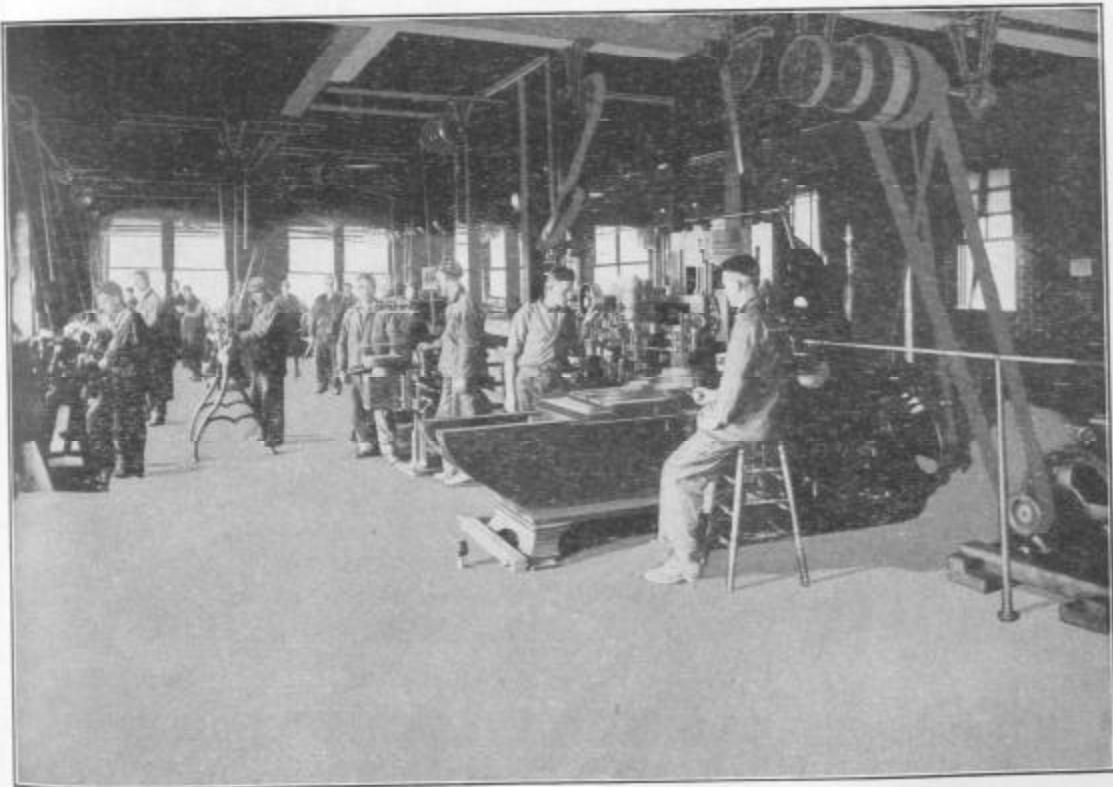


Morgan Park School, Steelton, Minn. (Seven South Bend Lathes)

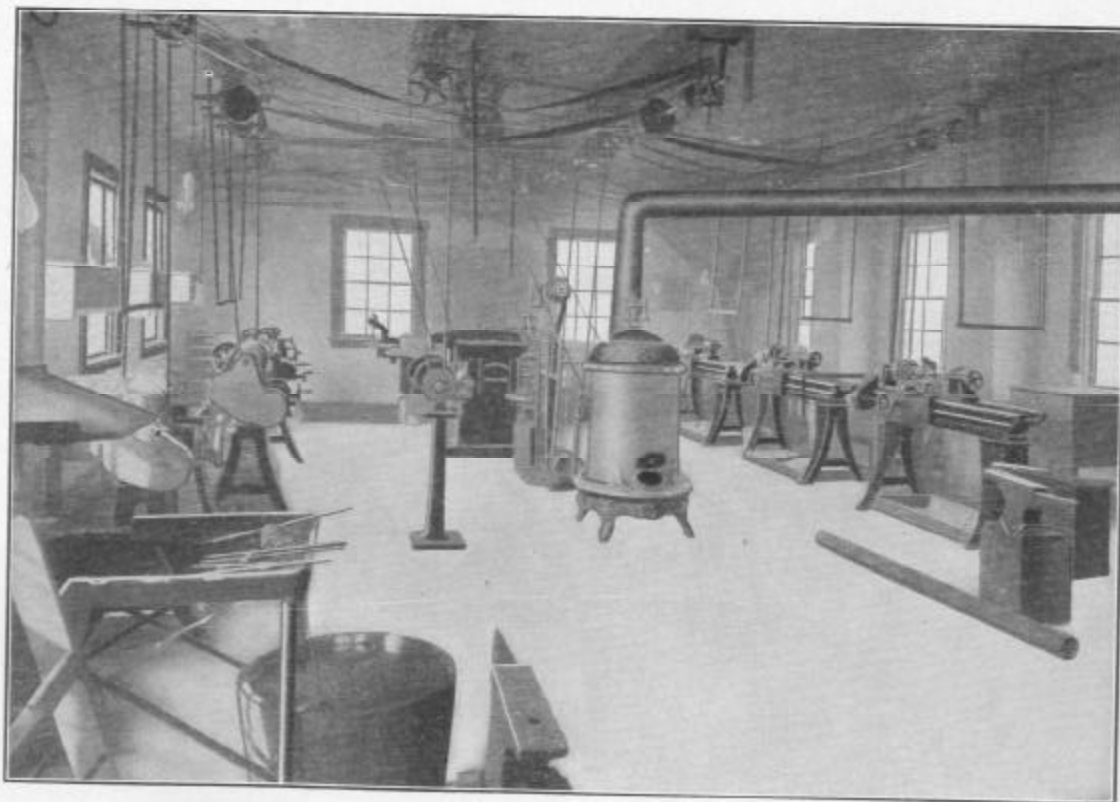


Solvay School, Solvay, New York. (Three South Bend Lathes)
Population Solvay, 6,000

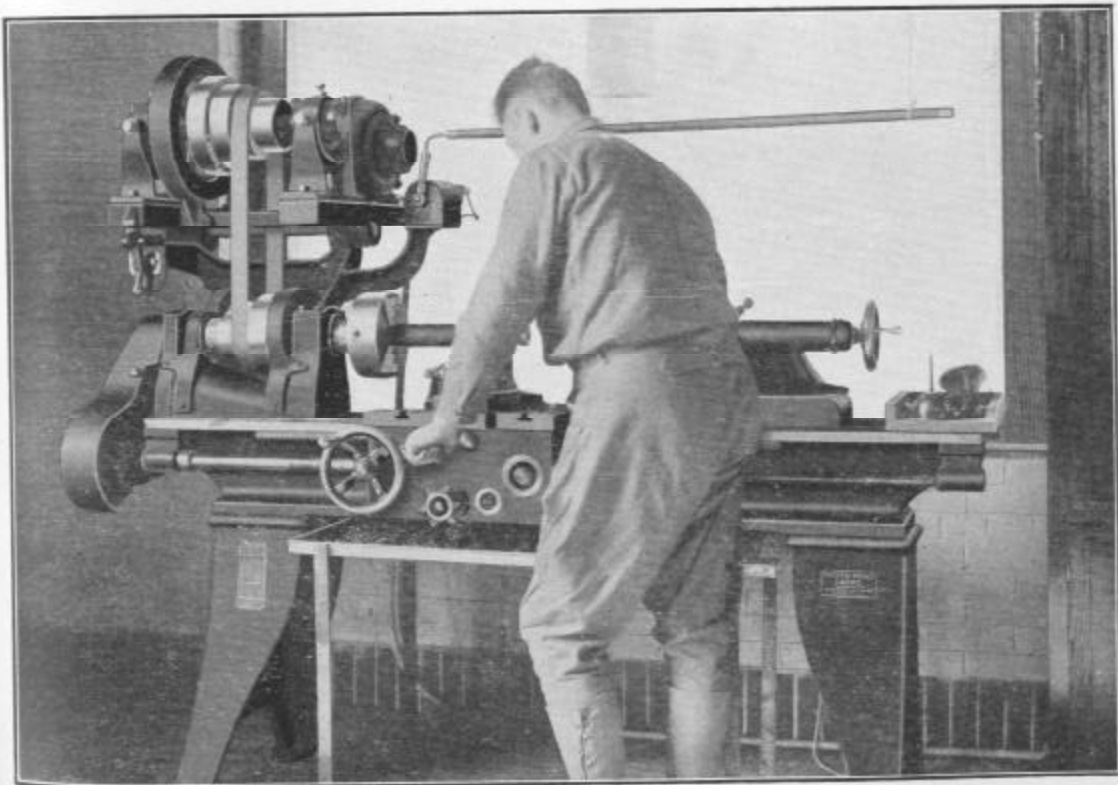




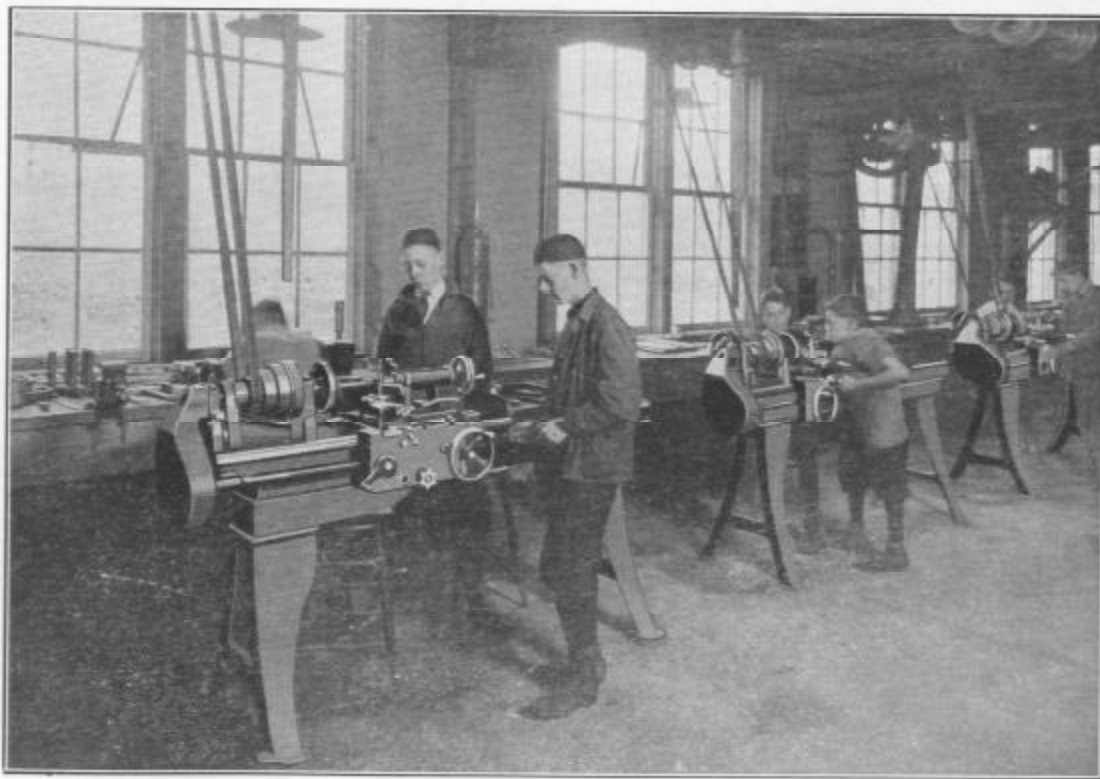
West Virginia University, College of Engineering, Morgantown, W. Va. (Five South Bend Lathes)



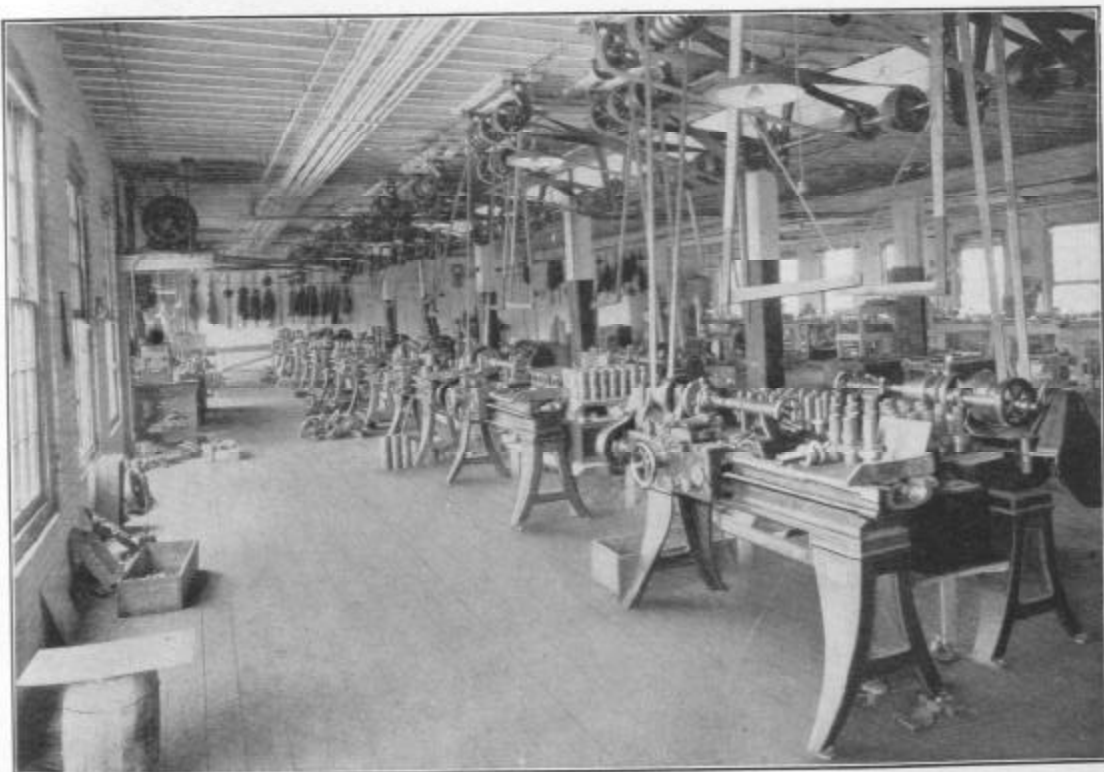
Wenatchee City School, Wenatchee, Wash. (Six South Bend Lathes)
Population Wenatchee, 4,645



Ottawa High School, Ottawa, Ill. Silent Chain Electric Drive South Bend Lathe)



Johnstown Vocational School, Johnstown, Pa. (Three South Bend Lathes)



Eighteen South Bend Lathes in a Manufacturing Plant

Tool Grinder as a Project in the School Shop

School builds 12 8-inch Tool Room Grinders

The illustration on the opposite page shows the interior of the Coronado High School shop. The 12 grinders and countershafts shown in the picture are the results of a year's work in this school shop by the students and the Instructor.

A closer view of the design of this grinder will be found on page 63, entitled "Bench Grinder." In addition to the bench grinder the school also made the column, pan, water pot and countershaft. The grinder complete is illustrated in our booklet entitled "First Year Lathe Work," from which the Instructor took the data for the manufacture of these grinders. He used the First Year Lathe Work as a text book. The boys enlarged the drawings shown in the book, made blue prints, made the patterns, secured the castings from a local foundry, machined the castings, painted the finished machines and prepared them in every way ready for the market.

None of this work was done outside the shop. The students and the Instructor did it all.

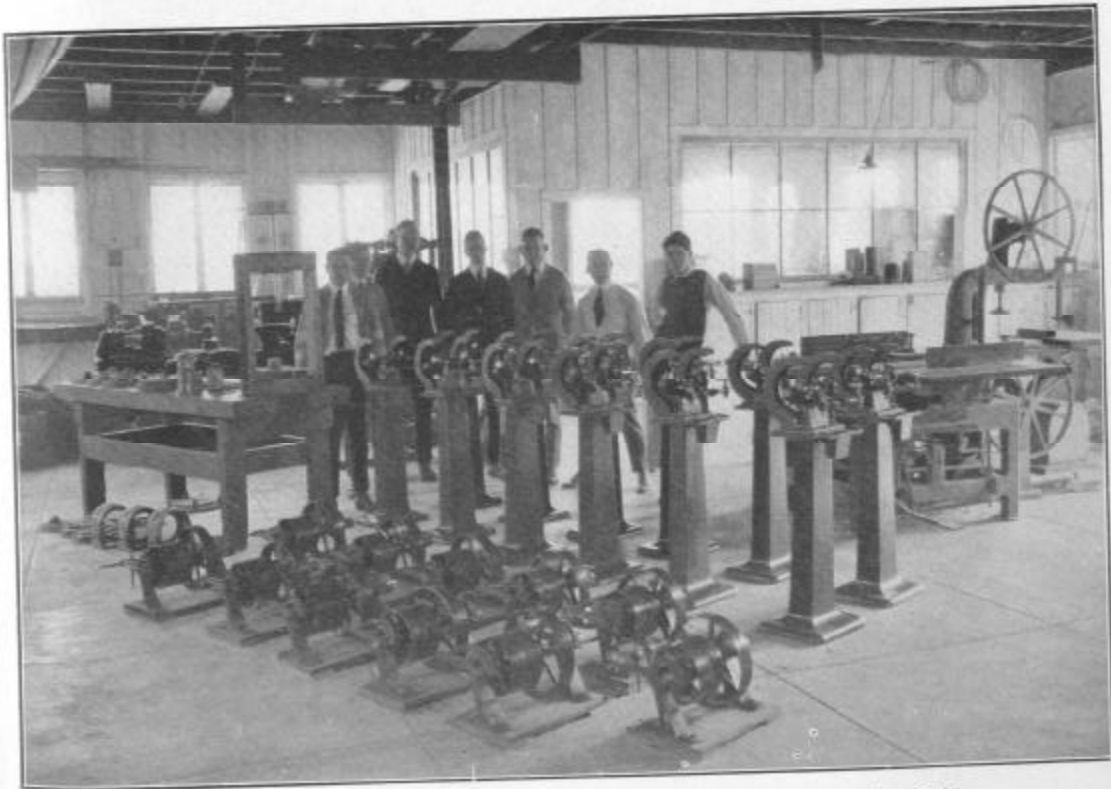
The equipment the Coronado High School shop had at that time consisted of one 15" South Bend Lathe, one drill press, one hack saw, and some woodworking machinery.

Any educator that is interested in the making of this grinder as a project for the school shop may on application receive free, a copy of this booklet entitled "First Year Lathe Work," which contains instruction for the building of the grinder and which is further described on page 63 of this booklet.

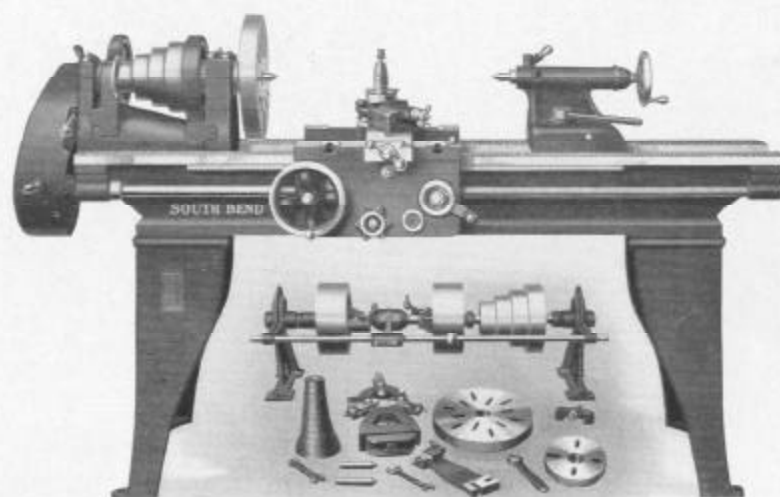
We think a project of this kind is an excellent thing for the school machine shop. It may appear a little difficult to the Instructor who has not had much machine shop experience, but it is really simple after the first grinder is built, and it is not such a difficult matter, with the aid of the book to build one grinder.

SMALL LATHE PROJECT

The 8-inch Bench Lathe described on page 62 is also an excellent project for the School Machine Shop.



Coronado High School, Coronado, California. Population Coronado, 5,100
Showing 12 — 8" Grinders Built by the Class



Regular Equipment as Illustrated Under Lathe, is Included in Price

No. 37-C—15-INCH x 6-FOOT SOUTH BEND LATHE

The Practical Size for the School Shop

Price: f. o. b. South Bend, Indiana \$505.00

No. 37-C—15-INCH x 6-FOOT SOUTH BEND LATHE

Fitted with Automatic Longitudinal Feed, Automatic Cross Feed and Compound Rest

The No. 37-C Lathe we recommend as the most practical size for the school shop

Bed is rigid, cross ribbed by heavy box braces cast in at short intervals its entire length; has three V's and one flat way for guiding the head stock, tail stock, and carriage. The rack attached is of steel, cut from the solid bar.

Head Stock is equipped with improved reverse. Spindle cone has four steps for 1 $\frac{3}{4}$ -inch belt. Spindle is of special carbon steel accurately ground; has 1 $\frac{3}{4}$ -inch hole its entire length. Centers are No. 3 Morse taper. Bearings are of heavy phosphor bronze with ample oiling facilities and are adjustable for wear.

Tail Stock is off-set to allow compound rest to swivel parallel to bed and is provided with set-over for turning taper. Tail stock center is self-ejecting.

Carriage is strong, with wide deep bridge; has T slots for clamping work for milling and boring. Both automatic cross feed and automatic longitudinal feed are operated from

the front of apron and but one feed at a time can be engaged. Both feeds are driven by a splined screw and worm so that the thread of the lead screw is used for thread cutting only.

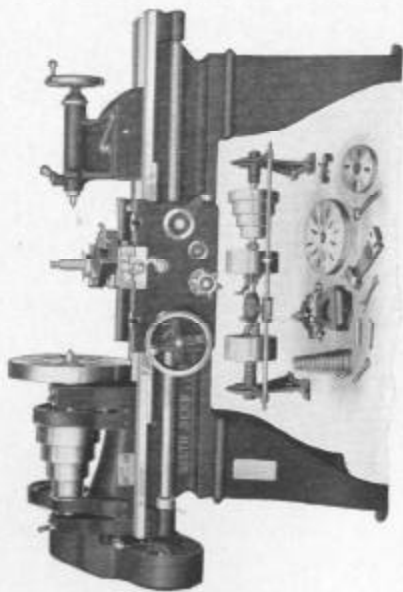
Thread Cutting. The lathe is indexed to cut standard threads from 4 to 40, right or left, including 1 $\frac{1}{2}$ pipe thread.

Graduation. The compound rest is graduated in degrees. The cross feed screw has micrometer graduated collar reading in one-thousandths of an inch.

Equipment as shown in cut is included in the price and consists of large and small face plates, compound rest, two steel centers, center rest, follower rest, change gears, adjustable stop for screw cutting, a set of feed gears, gear guards, necessary wrenches and double friction countershaft.

Weight of Lathe, crated for shipment, 1425 lbs.

Price: 1 No. 37-C, 15" x 6' South Bend Lathe, f. o. b. South Bend, Indiana, \$505.00.



No. 45 — 18-INCH SOUTH BEND LATHE
For Manufacturing and the General Machine Shop

We illustrate above the 18-inch South Bend Lathe. This lathe is a heavy, powerful tool, designed to give service for general all-around work. We recommend it for manufacturing and for general machine shop.

Carriage has T slots for clamping work for milling and boring. Both automatic cross feed and automatic longitudinal feed are operated from front of apron and but one feed at a time can be engaged. Both feeds are driven by a splined screw and worm so that the thread of the lead screw is used for screw cutting only.

Thread Cutting. Lathe is indexed to cut standard threads from 2 to 40, right or left, including $1\frac{1}{2}$ pipe thread.

Graduation. The compound rest is graduated in degrees. The cross feed screw has graduated micrometer collar reading in one-thousandths of an inch.

Equipment, as shown in cut, is included in the price and consists of large and small face plates, compound rest, two steel centers, center rest, follower rest, change gears, gear guards, necessary wrenches and double friction countershaft.

CATALOG. Free interesting catalog, describing the entire line of South Bend Lathes, showing prices of all lathes and attachments. **Catalog mailed free to any address.**

SOUTH BEND LATHES ARE BUILT IN THE FOLLOWING SIZES

No. 34—13-inch South Bend Lathe

No. of Lathe	Swing Over End	Length of Bed	Distance Between Centers	Hole Through Spindle	Approx. Weight on Skids Crated	Price F. O. B. South Bend
34-A	13 3/4 in.	4 ft.	18 in.	3/4 in.	950	\$385.00
34-B	13 3/4 in.	5 ft.	30 in.	3/4 in.	1000	400.00
34-C	13 3/4 in.	6 ft.	42 in.	3/4 in.	1050	415.00
34-D	13 3/4 in.	7 ft.	54 in.	3/4 in.	1100	430.00
34-E	13 3/4 in.	8 ft.	66 in.	3/4 in.	1150	450.00

No. 37—15-inch South Bend Lathe

37-B	15 3/4 in.	5 ft.	27 in.	1 1/8 in.	1350	\$483.00
37-C	15 3/4 in.	6 ft.	39 in.	1 1/8 in.	1425	505.00
37-D	15 3/4 in.	7 ft.	51 in.	1 1/8 in.	1500	524.00
37-E	15 3/4 in.	8 ft.	63 in.	1 1/8 in.	1650	545.00
37-G	15 3/4 in.	10 ft.	87 in.	1 1/8 in.	1900	587.00

No. 40—16-inch South Bend Lathe

40-C	16 3/4 in.	6 ft.	36 in.	1 1/8 in.	1700	\$550.00
40-D	16 3/4 in.	7 ft.	48 in.	1 1/8 in.	1750	570.00
40-E	16 3/4 in.	8 ft.	60 in.	1 1/8 in.	1825	590.00
40-G	16 3/4 in.	10 ft.	84 in.	1 1/8 in.	2025	630.00
40-H	16 3/4 in.	12 ft.	108 in.	1 1/8 in.	2250	690.00

No. 45—18-inch South Bend Lathe

45-C	18 3/4 in.	6 ft.	31 in.	1 3/8 in.	2250	\$735.00
45-D	18 3/4 in.	7 ft.	43 in.	1 3/8 in.	2325	760.00
45-E	18 3/4 in.	8 ft.	55 in.	1 3/8 in.	2450	785.00
45-G	18 3/4 in.	10 ft.	79 in.	1 3/8 in.	2550	835.00
45-H	18 3/4 in.	12 ft.	103 in.	1 3/8 in.	2750	910.00

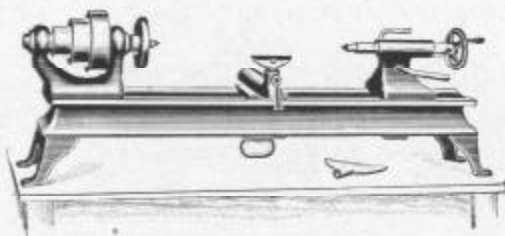
No. 47—21-inch South Bend Lathe

47-D	21 3/4 in.	7 ft.	39 in.	1 1/2 in.	2875	\$960.00
47-E	21 3/4 in.	8 in.	51 in.	1 1/2 in.	3085	930.00
47-G	21 3/4 in.	10 ft.	75 in.	1 1/2 in.	3325	990.00
47-H	21 3/4 in.	12 ft.	99 in.	1 1/2 in.	3750	1085.00
47-K	21 3/4 in.	14 ft.	123 in.	1 1/2 in.	4025	1160.00

No. 54—24-inch South Bend Lathe

54-E	24 3/4 in.	8 ft.	46 in.	1 3/4 in.	3975	\$1250.00
54-G	24 3/4 in.	10 ft.	70 in.	1 3/4 in.	4475	1330.00
54-H	24 3/4 in.	12 ft.	94 in.	1 3/4 in.	4725	1425.00
54-K	24 3/4 in.	14 ft.	118 in.	1 3/4 in.	5150	1505.00
54-M	24 3/4 in.	16 ft.	142 in.	1 3/4 in.	5385	1585.00

An Excellent Project for the School Machine Shop



8-INCH BENCH LATHE
24 inches Between Centers

The above illustration shows an 8" Bench Lathe which is an excellent project for the school machine shop.

The spindle has $\frac{1}{2}$ " hole its entire length. Boxes are phosphor bronze and adjustable. Width of belt $1\frac{1}{4}$ ". Weight of Lathe 80 pounds.

To schools interested in this small lathe as a project we will be pleased to furnish blue prints, giving the detail of all parts, and if castings in the rough are desired we can furnish them also. From these blue prints the class could make

their patterns and have castings made in their home town.

The 8" bench lathe is not a toy, but a machine which we formerly built for the trade. They are used by jewelers as a polishing lathe and by large manufacturers of small parts for various operations on light work.

It is also an excellent tool for class work in the Junior High School Shop. In many schools the boys buy the castings and machine them in the school shop, and take the lathe home when finished.



Lathe Countershaft

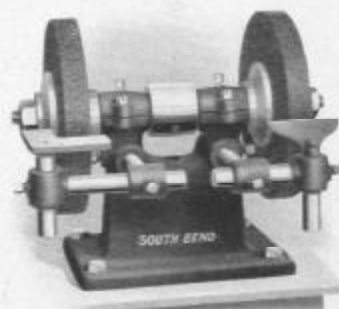
Above cut shows countershaft for 8-inch Bench Lathe. — Weight, 40 pounds. — Tight and loose pulleys are 5"x2".



FIRST YEAR LATHE WORK
How to Make an 8-inch Grinder

First Year Lathe Work, is a text book for the school Machine Shop. It contains instructions for building an 8" tool room emery grinder. This is an excellent project for vocational and industrial schools, because at least one of these grinders can be used to good advantage in every school shop.

First Year Lathe Work contains detail drawings of the grinder. Accompanying each drawing are complete instructions as to how to proceed with the machine work.



8-inch Bench Tool Room Emery Grinder

The above illustration shows an 8" tool room emery grinder built by students who used First Year Lathe Work as their text. This machine complete is fitted with a column, pan and water pot, also with a countershaft. All these parts are described and illustrated in First Year Lathe Work.

FIRST YEAR LATHE WORK
Price, 10 Cents

First Year Lathe Work, postpaid on receipt of 10 cents, coin or stamps accepted. Copy of this book sent free to any educator.



A copy of this Text Book free, postpaid, to
 any educator.

"HOW TO RUN A LATHE"

A Partial List of Contents

Layout for a small machine shop.
 Speed and diameter of line shaft.
 Horsepower required to drive a lathe.
 Rules for figuring size of pulleys.
 How to find the pitch of a screw.
 Milling and keyseating in the lathe.
 How to case-harden a piece of mild steel.
 How to harden and temper a lathe tool.
 Rule for gearing any lathe for thread cutting.
 How to fit a lathe chuck to a lathe.
 Cutting speeds for different metals.
 How to make a boring bar for the lathe.
 Application and use of lathe tools.
 Boring in the lathe.
 Turning taper in the lathe.
 How to reseat a valve in the lathe.
 Grinding in the lathe.
 Making and fitting of piston rings.
 Making of ball race and cone, etc., etc.

The hand-book entitled, "How to Run a Lathe," is in use as text-books in schools of the United States. It teaches the fundamental principles of machine shop work for the beginner thus relieving the instructor of much unnecessary detail.

A copy of this valuable little 80-page book will be sent, postpaid, to any address on receipt of 10c. Coin or stamps of any country accepted.

FREE LATHE CATALOG

Printed also in the Spanish, and Portuguese Languages

Our new 64 page Catalog No. 60, just off the press, illustrates and describes South Bend Lathes, lathe chucks, draw-in chucks, centers, cutting tools, lathe dogs, milling attachments, electric drive attachments, etc.

Attached to catalog is a price list showing the net selling prices of our entire line.

Every shop instructor should have a copy. It is free, postpaid to any address. Drop us a postal card today—giving your address—street and number, to insure delivery.

22,000 South Bend Lathes are in use in manufacturing, the general machine shop, and industrial work throughout the world.

SOUTH BEND LATHE WORKS :: SOUTH BEND, IND.
425 EAST MADISON STREET

A FEW USERS OF SOUTH BEND LATHES

Ford Motor Co.....	Detroit, Mich.	Remington Arms U. M. C. Co....	Hoboken, N. J.
Marlin Arms Corp.....	New Haven, Conn.	New York Ship Building Co.....	Several Places
Victor Talking Machine Co.....	Camden, N. J.	National Lamp Works.....	Cleveland, Ohio
Union Pacific Railroad.....	Omaha, Neb.	International Harvester Co.....	Detroit, Mich.
Westinghouse Elec. Mfg. Co.....	Pittsburgh, Pa.	Peters Cartridge Co.....	Kings Mills, Ohio
Colts Patent Fire Arms Mfg. Co..	Hartford, Conn.	American Can Co.....	New York, N. Y.
Eastman Kodak Co.....	Columbus, Ohio	General Electric Co.....	Several Places
Singer Sewing Machine Co.....	Several Places	United States Government.....	Several Places
Packard Motor Car Co.....	Several Places	Standard Oil Co.....	Several Places
Wagner Electric Co.....	St. Louis, Mo.	Cambria Steel Co.....	Johnstown, Pa.
Air Reduction Co.....	Several Places	American Can Co.....	New York, N. Y.
Emergency Fleet Corp.....	Several Places	Chicago Flexible Shaft Co.....	Chicago, Ill.
Haynes Motor Car Co.....	Kokomo, Ind.	Timkin Roller Bearing Co.....	Canton, O.
National Biscuit Co.....	Chicago, Ill.	United States Government.....	Several Places
Liggett & Myers Tobacco Co....	Several Places	Burroughs Adding Machine Co...	Detroit, Mich.
Libby, McNeal & Libby.....	Chicago, Ill.	Briscoe Motor Corp.....	Detroit, Mich.
Union Metallic Cartridge Co....	Weehawken, N. J.	Diamond Match Co.....	Oswego, N. Y.
Allis-Chalmers Mfg. Co.....	Milwaukee, Wis.	E. I. Dupont de Nemours Co.....	Several Places
U. S. Military Academy.....	West Point, N. Y.	Edison Lamp Work.....	Harrison, N. J.
Pennsylvania Railroad.....	Pittsburgh, Pa.	U. S. Navy ...	Several Battleships and Destroyers
Thos. A. Edison.....	Orange, N. J.	Studebaker Auto Co.....	Detroit, Mich.

OVER 22,000 SOUTH BEND LATHES ARE IN SERVICE