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* * * * * * * *

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# BRASS TABLE LAMPS

## INTRODUCTION

The purpose of this report is to present basic information for establishing a manufacturing plant in a foreign country to produce approximately 4,000 brass lamps per month.

Many types of brass lamps are manufactured in the United States each year, and each type is produced in a vast number of sizes and designs. Thus labor and material costs will vary according to the type, size, and design, in addition to the quality of the lamp produced.

Furthermore, it has become a very prevalent practice in the United States for brass lamp manufacturers to buy the component parts of a lamp from other companies, such as white metal casting companies, metal stamping, spinning, and electroplating companies, and lamp shade manufacturers. This results in the lamp manufacturer's activities being confined to finishing and assembling, which is the type of plant described in this report. Separate, specialized operations such as this represent a very economical method for producing brass lamps.

## GENERAL ASSUMPTIONS

In order to make estimates which are realistic, the following assumptions are necessary:

1. The costs of the site, building, and equipment are based on United States prices.

2. Material costs are based on sizes and specifications of materials used in the United States.

3. Labor costs are based on the average for the industry in the Great Lakes region of the United States.

4. Adequate power and water are available at the plant site.

5. Adequate transportation facilities are available at the plant site.

6. The plant operates eight hours a day, five days a week, and fifty weeks per year.

7. No special provision is made for the training of new personnel. It is assumed that beginner's rates are paid in such cases.

8. The following items cannot be estimated realistically:

   A. Land value
   B. Selling expenses
   C. In-freight and out-freight
   D. Taxes

   Estimates have been made of each of these items solely for the purpose of completing this report.

9. All cost estimates contained in this report are subject to adjustments to reflect local prices and local conditions.

## PRODUCT SPECIFICATIONS

As indicated in the Introduction there are many factors other than quality which have a direct bearing on the specifications for a brass lamp.

Since it would be impractical to incorporate specifications for several sizes and designs of each type of lamp, this report will present the requirements for manufacturing a table lamp of average size and quality. It is assumed that the shades and the various parts and fittings used in making brass lamps will be purchased from other manufacturers.

## PRODUCTION CAPACITY

It is contemplated that the plant will be able to finish and assemble approximately 4,000 lamps per month or 48,000 per year.

## MANUFACTURING OPERATIONS

The average brass table lamp contains three principal sections - base, break, and fount.

The base and fount sections are purchased from metal products companies possessing equipment and personnel capable of forming pieces of brass sheets or coils into the desired shapes by the spinning process which is a specialized but economical operation involving the application of localized pressure to a rotating disk of brass sheeting to draw it over a one-piece chuck. Considerable skill is required by the operator because the spinning tool (a rounded-end wood or metal tool or roller) is held and manipulated manually. An experienced spinner will receive approximately $3.50 per hour.

Breaks are purchased from white metal casting companies. The lamp company furnishes the casting company with the slush molds to be used in the manufacture of the break in white metal form. When the break is received from the casting company, it is polished on a polishing wheel until all scratches and surface imperfections have been eliminated. It is then sent to an electroplating company for brass plating.

All sections, bases, breaks and founts, are then buffed and polished to either a satin brass finish or a bright brass finish.

The satin finish is an effect obtained by deadening a smooth finished surface and then lacquering it with a heavy-bodied, bright-drying lacquer. After an initial polishing the piece is dipped into a solution of water and

a commercial compound containing pumice. It is then brushed wet with a wire or bristle wheel. The dipping and brushing operation is repeated twice.

The bright brass finish is obtained by polishing to a high gloss with cotton and sheepskin buffing wheels and the application of a variety of commercial polishing compounds, including a high grade brass rouge.

Since polishing and buffing wheels differ in size, type, and speed, the polishing composition must be formulated to actual working conditions. This is best resolved by contacting an experienced technician of a composition manufacturer. It will then be possible to decide on the most suitable polishing composition for a particular purpose, which one will provide the highest output, and whether preference should be given to water-soluble pastes or polishing emulsions.

The final buffing and polishing operations for both satin and bright brass finishes are followed by the application of a protective coat of lacquer.

The various sections or pieces are then placed on spindles or racks for drying.

## ASSEMBLING AND PACKING OPERATIONS

The brass sections of the lamp are assembled on a form consisting of a loader and a piece of threaded pipe. The loader is made of gray iron and its size and contour are designed to fit inside of the base. This provides the weight needed in the base of the lamp. One end of the pipe is inserted through a hole in the base and screwed into the loader.

The break, fount and cap are then placed on top of the base in that order, with brass seating rings inserted between each piece. Round brass locknuts are used to hold the assembled pieces securely in place.

Wire is run through the pipe and connected to the socket which is fastened to the top end of the pipe.

The wrapper attaches a piece of felt to the bottom of the lamp, installs the harp and finial, and places each assembled lamp in a plastic bag. Lamps and shades are packed in separate cartons for shipping.

## DIRECT MATERIALS

As stated in the description of product specifications on page 2, it would be confusing, if not impossible, to list the costs of materials for all types and sizes of brass lamps. The costs listed below, therefore, represent the direct materials costs incurred in the production of average sized table lamps.

| Item | Unit Cost | No. of Units | Monthly Cost Estimated | Monthly Cost Actual |
|---|---|---|---|---|
| Loaders | 10¢ per lb. | 8,000 lbs | $ 800 | _____ |
| Base | 45¢ | 4,000 | 1,800 | _____ |
| Break | 85¢ | 4,000 | 3,400 | _____ |
| Fount | 40¢ | 4,000 | 1,600 | _____ |
| Harp | 18¢ | 4,000 | 720 | _____ |
| Wiring (8' piece) | 15¢ | 4,000 | 600 | _____ |
| Socket | 20¢ | 4,000 | 800 | _____ |
| Finials | 10¢ | 4,000 | 400 | _____ |
| Seating rings, lock-nuts and felt | 5¢ | 4,000 | 200 | _____ |
| Shades, silk | $3.00 | 4,000 | 12,000 | _____ |
| Plastic bags | 3¢ | 4,000 | 120 | _____ |
| Cartons | 60¢ | 1,333 | 800 | _____ |
| Lacquer | | | 1,300 | _____ |
| Total per month | | | $ 24,540 | _____ |
| Annual cost | | | $294,480 | _____ |

## PRODUCTION TOOLS AND EQUIPMENT

| Description | Number Required | Unit Cost | Cost Estimated | Cost Actual |
|---|---|---|---|---|
| Buffing & Polishing Machines | 5 | $1,500 | $ 7,500 | _____ |
| Buffs and Polishing Wheels | | | 1,000 | _____ |
| Molds | 10 | 400 | 4,000 | _____ |
| Dust Collector | | | 1,700 | _____ |
| Spray Booth and Related Equipment | | | 800 | _____ |
| | | | $15,000 | _____ |

## OTHER TOOLS AND EQUIPMENT

| Description | Cost Estimated | Cost Actual |
|---|---|---|
| Racks, shelving, work bench, tables and chairs | $1,500 | _____ |
| Maintenance tools | 300 | _____ |
| Spare parts | 500 | _____ |
| | $2,300 | _____ |

## SUPPLIES

| Item | Cost Estimated | Cost Actual |
|---|---|---|
| Lubricants and Hand Tools | $ 200 | _____ |
| Buffing and Polishing Compositions | 500 | _____ |
| Maintenance materials | 300 | _____ |
| Office Supplies | 200 | _____ |
| | $ 1,200 | _____ |

## DIRECT LABOR

| Job Classification | Number Required | Hourly Rate | Monthly Cost Estimated | Monthly Cost Actual |
|---|---|---|---|---|
| Buffers | 2 | $2.50 | $ 840 | _____ |
| Polishers | 8 | 2.50 | 3,360 | _____ |
| Finishers | 2 | 2.00 | 670 | _____ |
| Assemblers | 2 | 1.60 | 540 | _____ |
| Wirer | 1 | 1.60 | 270 | _____ |
| Wrapper | 1 | 1.40 | 235 | _____ |
| Packer | 1 | 1.40 | 235 | _____ |
| Total per month | | | $ 6,150 | _____ |
| Annual cost | | | $73,800 | _____ |

## INDIRECT LABOR

| Job Classification | Number Required | Hourly Rate | Annual Cost Estimated | Annual Cost Actual |
|---|---|---|---|---|
| Manager | 1 | | $12,000 | _____ |
| Foreman | 1 | | 6,500 | _____ |
| Bookkeeper Clerk | 2 | | 8,000 | _____ |
| Maintenance Man | 1 | $2.40 | 4,800 | _____ |
| Receiver & Shipper | 1 | 2.00 | 4,000 | _____ |
| Annual cost | | | $35,300 | _____ |

## DEPRECIATION

| Item | Estimated Cost | Estimated Life | Annual Provision Estimated | Annual Provision Actual |
|---|---|---|---|---|
| Building | $30,000 | 20 | $1,500 | _____ |
| Production Tools & Equipment | 15,000 | 10 | 1,500 | _____ |
| Other Tools and Equipment | 2,300 | 10 | 230 | _____ |
| Furniture and Fixtures | 1,200 | 10 | 120 | _____ |
| | | | $3,350 | _____ |

## MANUFACTURING OVERHEAD

| Item | Annual Cost Estimated | Annual Cost Actual |
|---|---|---|
| Depreciation | $ 3,350 | _____ |
| Indirect Labor | 35,300 | _____ |
| Power | 3,600 | _____ |
| Water | 200 | _____ |
| Fuel | 500 | _____ |
| Supplies | 1,200 | _____ |
| Design Costs | 1,000 | _____ |
| | $45,150 | _____ |

## FURNITURE AND FIXTURES

| Description | Number Required | Unit Cost | Cost Estimated | Cost Actual |
|---|---|---|---|---|
| Desk & Chairs | 4 | $150 | $ 600 | _____ |
| Typewriter | 1 | 150 | 150 | _____ |
| Adding Machine | 1 | 150 | 150 | _____ |
| Filing Cabinets | 3 | 100 | 300 | _____ |
| | | | $1,200 | _____ |

## PLANT LAYOUT

A plant layout showing the location of machinery and equipment is shown on page 22.

## PLANT SITE

To provide for eventual expansion about 15,000 square feet of land is required. The site should be as advantageously located as possible with respect to transportation facilities, power, water, fuel, sources of labor and markets. The cost of the site is estimated at $2,000.

## BUILDING

To provide for some expansion a one-story building 75 feet by 100, or 7,500 square feet, will be required for all operations including the office. The cost of the building, including the boiler for heating, adequate plumbing and wiring is estimated at $4.00 per square foot, or a total of about $30,000.

## FIXED ASSETS

| Item | Cost Estimated | Cost Actual |
|---|---|---|
| Land | $ 1,000 | _____ |
| Building | 30,000 | _____ |
| Production Tools and Equipment | 15,000 | _____ |
| Other Tools and Equipment | 2,300 | _____ |
| Furniture and Fixtures | 1,200 | _____ |
| | $49,500 | _____ |

## WORKING CAPITAL

| Item | | Cost Estimated | Cost Actual |
|---|---|---|---|
| Direct Materials | 30 days | $24,540 | _____ |
| Direct Labor | 30 days | 6,150 | _____ |
| Manufacturing Overhead | 30 days | 3,760 | _____ |
| Reserve for Sales Collections | 30 days | 48,000 | _____ |
| | | $82,450 | _____ |

## SALES REVENUE

The price for the average sized table lamp specified in this report is $12.00

Based on an annual production of 48,000 lamps, annual gross sales would be $576,000.

## RECAPITULATION OF COSTS, SALES, AND PROFITS

| | | Estimated | | Actual | |
|---|---|---|---|---|---|
| **Gross Sales:** | | $576,000 | | _____ | |
| Less - Discount & Allowances | | 11,500 | | _____ | |
| Net Sales | | | $564,500 | | _____ |
| **Manufacturing Costs:** | | | | | |
| Direct Materials | | $294,480 | | _____ | |
| Direct Labor | | 73,800 | | _____ | |
| Manufacturing Overhead | | 45,150 | | _____ | |
| | | $413,430 | | _____ | |
| **Selling Expenses:** | | | | | |
| Commissions, etc. | $40,000 | | | _____ | |
| Exhibiting Costs | 4,000 | $ 44,000 | 457,430 | _____ | _____ |
| Net Operating Profit | | | $107,070 | | _____ |
| **Other Expenses:** | | | | | |
| Interest on Loans | | $ 2,500 | | _____ | |
| Insurance | | 500 | | _____ | |
| Legal | | 1,200 | | _____ | |
| Audit | | 2,400 | 6,600 | _____ | _____ |
| Net Profit before Taxes | | | $100,470 | | _____ |

## BUDGET CONTROL

A purchase requisition form designed to indicate the purpose of the procurement and to furnish information which will assist in controlling expenditures is shown on the following page.

The form furnishes full details with respect to the materials or services to be purchased and gives the accounting distribution of the amounts involved by major control accounts. The latter information, when compiled cumulatively, will permit the manager to compare actual expenditures with the budgeted amounts. The purchase requisition will not cover such items as power and water which are usually purchased under contract, or labor costs which may be reviewed by referring to the payroll vouchers.

Following the requisition form, a sample voucher check is shown. This form of check should be used for payment of all liabilities and expenses. Space is provided in the lower portion of the voucher for listing the accounting distribution of the expenditure.

At the end of each month the manager will receive a comparative statement of actual and budgeted expenditures. The bookkeeper will prepare supplemental break-downs of those expenditures for which the variances between actual and budgeted amounts are substantial. This information will enable the manager to determine the reason for the variance and take corrective action if necessary.

If at any time during the month it becomes apparent that actual expenditures will exceed the budgeted amount, the bookkeeper will bring this to the attention of the manager for his information and action.

### BUDGET CONTROL ACCOUNTS

| Account | Acct. No. | Current Month | | Months to Date | |
|---|---|---|---|---|---|
| | | Actual | Budget | Actual | Budget |
| Direct Materials | | _____ | $24,540 | _____ | $294,480 |
| Supplies | | _____ | 100 | _____ | 1,200 |
| Direct Labor | | _____ | 6,150 | _____ | 73,800 |
| Indirect Labor | | _____ | 2,940 | _____ | 35,300 |
| Power | | _____ | 300 | _____ | 3,600 |
| Water | | _____ | 16 | _____ | 200 |
| Fuel | | _____ | 42 | _____ | 500 |
| Design Costs | | _____ | 83 | _____ | 1,000 |
| Capital Expenditures | | _____ | 200 | _____ | 2,400 |
| Depreciation | | _____ | 280 | _____ | 3,350 |

ABC MANUFACTURING COMPANY

PURCHASE REQUISITION

Control Account Distribution

| Description | Acct. No. | Amount |
|---|---|---|
| Capital Expenditures | | |
| Direct Materials | | |
| Supplies | | |
| Other _____ | | |
| _____ | | |

Req. No. _____

Date _____

Delivery Date _____

Purchase Order No. _____

Purchasing Agent:

Please order the following materials or services:

| Quantity | Description | Unit Price | Total Cost |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Quotation Record

| Item | Vendor | Quote | Date |
|---|---|---|---|
| | | | |

Submitted by: _____

Approved by: _____

ABC MANUFACTURING COMPANY

Street Address

City, State _____, 196____ No. 1000

Pay _____ Dollars $_____

To The Order Of

ABC Manufacturing Company

To FIRST NATIONAL BANK 10-20/300

City, State

By _____

Treasurer

(Detach This Statement Before Depositing Check)

ABC MANUFACTURING COMPANY · SETTLEMENT STATEMENT

Attached check is tendered in settlement of items listed hereon.

If correct no receipt is required - If not correct return check with explanation

| Date | Items | Amount | Account |
|---|---|---|---|
| | | | |

## ENGINEERS

The services of professional engineers are desirable in the design of this plant, even though the proposed plant is small.

The correct design is one which provides the greatest economy in the investment of funds and establishes the basis of operation that will be most profitable in the beginning and will also be capable of expansion without expensive alteration.

The addresses of professional engineers who specialize in industrial design, some of whom may be willing to undertake such work on low cost projects overseas, can be secured by reference to the published cards in various engineering magazines. They may also be reached through their national organizations, one of which is the

National Society of Professional Engineers
2029 K Street, Northwest,
Washington 6, D. C.

Manufacturers of industrial equipment employ engineers familiar with the design and installation of their specialized products. These manufacturers are usually willing to give prospective customers the benefit of technical advice by those engineers in determining the suitability of their equipment in any proposed project.

The equipment manufacturers also know, and can recommend, professional engineers in private practice, who are willing and able to provide appropriate consulting services.

## TRAINING

Manufacturing an inferior quality of product during the training period could create sales resistance that might be difficult to cope with later. To avoid such possibilities, the quality of the product should be maintained at all times, including the training period.

In some areas skilled operators may be available locally. In other areas all the operators may have to be trained.

If skilled operators are not available, adequate training would be assured by using one or more of the following methods:

A. If the plant is designed and installed by a competent engineering firm, the contract should be negotiated, if possible, on a turn-key basis. On this basis the contractor agrees to operate the plant and produce the quality and quantity of the product stated in the contract for an agreed period of time. Such a contract would assure adequate personnel training, since full quantity and quality could not be produced with an untrained organization.

B. The engineering firm that designs and installs the plant can usually make training arrangements to have key personnel placed, for training purposes, in a foreign industry that produces the same type of product. This would provide training for the key personnel while the plant is being installed.

C. If neither of the above methods is possible, then qualified and experienced individuals should be employed for the key positions, either permanently or temporarily, to perform the key operations and assist in training the organization, even if they must be secured outside the country.

D. The manager should have years of successful experience in this type of business and be fully qualified in all phases of management, including the training of employees.

## SAFETY

There is always danger of accident and injury in any industrial plant. Because of this, the manager should take specific action to bring to the attention of each employee the importance of safety precautions and intelligent first aid.

Practically all machines have safety appliances, and the manager should see that these are in good working condition and that the operators are making full use of them.

In addition to constant watchfulness to make sure that all practicable safety precautions are taken, first aid supplies should be readily available. One complete first aid kit should be maintained near the manager's office, and others at appropriate places throughout the plant. Some of the employees should be trained to provide first aid service.

The use of accident posters in the plant have proved to be of value in reducing accidents. It is recommended that such posters be used, and that some direct special action be taken by the manager, at least once each month, to bring to the attention of all personnel the importance of safety precautions.

A fire brigade should be established and each member trained as to his responsibility in case of fire. Fire drills should be conducted periodically.

It is recommended that the employees be encouraged to offer suggestions or recommendations relative to prevention of accidents, removal of fire hazards and maintaining general interest in all safety factors.

## OTHER CONSIDERATIONS

There are other important subjects, shown below, that should be fully investigated and considered. Information on these subjects is usually available from such sources as banks, government agencies, exporters and importers, wholesalers, retailers, transportation companies and manufacturers.

## MATERIALS AND SUPPLIES

1. Are all materials and supplies available locally?
2. Is the local material market competitive?
3. Is satisfactory delivery of local materials assured at reasonable prices?
4. What materials and supplies must be imported?
5. Are they available in world markets at competitive prices?
6. Would prompt delivery of imported materials and supplies be assured so that large inventories would not be required?

## MARKET FACTORS

1. Is there already a demand for the product?
   - A. Who are the principal consumers?
   - B. Who are possible new consumers?

2. How is demand for the product now satisfied?
   - A. By local production? If so, what is the volume of annual production?
   - B. What percentage of consumption is filled by local production?
   - C. By imports? If so, what is the volume of annual imports?
   - D. What percentage of consumption is met by imports?
   - E. From what areas are imports derived?

3. What is the estimated annual increase in local consumption over the next five years?
   - A. How were such estimates made?
   - B. By reference to official figures on population growth, family budgets, imports, etc.?
   - C. By consultation with trade or industry, ministries, associations, bankers, commercial houses, wholesalers, retailers, industrial consumers, etc.?

4. If the product is already being manufactured, can the existing and estimated future local market absorb production of the new plant without price-cutting or other dislocations?

5. Would the estimated sales price and quality of the new product make it competitive with an imported equivalent?
   A. After adjusting cost to local conditions, is the estimated sales price of the product so high that tariff protection is necessary to protect it from imports?

## EXPORT MARKETS

1. Could the product compete in export markets on the basis of price, quality and dependability of supply?
2. Can export markets for the product be developed?
3. If so, in what areas and in what annual volume?
4. What procedures would be necessary to develop export markets?
5. What would it cost?

## MARKETING PROBLEMS

1. In calculating costs of the product, has adequate allowance been made for the expense of a sales department, advertising and promotion that might be required?

2. Do consumer prejudices against locally manufactured products exist?
   A. If so, why?
   B. Would they apply to the new product?
   C. If so, how could they be overcome and what would it cost to do so?

3. Do marketing and distribution facilities for the product exist?
   A. If not, can they be set up?
   B. What would it cost to do so?

4. Will the product be sold to:
   A. Wholesalers?
   B. Retailers?
   C. Direct to consumer?
   D. Other industries?
   E. Government?

## ECONOMIC FACTORS

1. How much foreign exchange (and in what currency) is required to import machinery, equipment and supplies:
   A. How much foreign exchange (and in what currency) is required for annual interest payments and amortization of any loans contracted to import machinery and equipment, or for payment of royalties and technical services?
   B. How much foreign exchange (and in what currency) is required for annual import of raw materials and supplies?
   C. What are estimated annual foreign exchange earnings and in what currencies?
   D. Has careful consideration been given to the possibility of depreciation in the foreign exchange value of the local currency?
   E. Has careful consideration been given to the possibility of import controls, or restrictions on availabilities of foreign exchange necessary to operate the business?
   F. What benefits would the new business bring to the economy in the use of local raw materials: in employment and in technology?
   G. Do dependable facilities exist for transportation, power, fuel, water and sewage?
      (1) If not, can existing deficiencies be eliminated satisfactorily?
      (2) What would be the cost to do so?

## PERSONNEL

1. Is there an adequate labor supply near the plant location?
   A. If not, how can the problem be solved?

2. Can the problem of training competent management and supervisory personnel be solved?
   A. Also, the training of skilled labor?
   B. Is technical advice available in the locality?
   C. If not, where can it be obtained and what will it cost?

## LAWS AND REGULATIONS

1. Do existing labor laws, government regulations, laws and taxes favor establishment of new business?
   A. If not, can existing obstacles be removed?
   B. If so, how and when?

## FINANCIAL FACTORS

1. Technical advice on selection of machinery and equipment.
   A. In selecting the machinery and equipment for the new plant, have reputable and competent engineers and technicians been consulted?
   B. Have they been asked for advice on the most suitable types of machinery and equipment for the process and locality?
   C. Have they carefully compared costs of various suppliers?
   D. Credit terms offered purchasers?

## FINANCIAL REQUIREMENTS OF THE PROJECT

1. In estimating the cost of the project, has careful consideration been given to:
   A. The effect on costs of delays in construction schedules?
   B. In delivery and installation of machinery and equipment?
   C. In import of essential raw materials and supplies?

2. In calculating cash flow and working capital requirements, has careful consideration been given to:
   A. Maintaining adequate inventories of raw materials?
   B. Supplies and spare parts?
   C. Seasonal fluctuations in the business?
   D. The time required to liquidate credit sales to customers and bad debts?
   E. The period necessary to get the plant into production?
   F. Cash required to amortize its principle loans?

3. If the economy is in a period of inflation, has full allowance been made for the influence of rising prices and wages on the cost of the project and on working capital requirements?

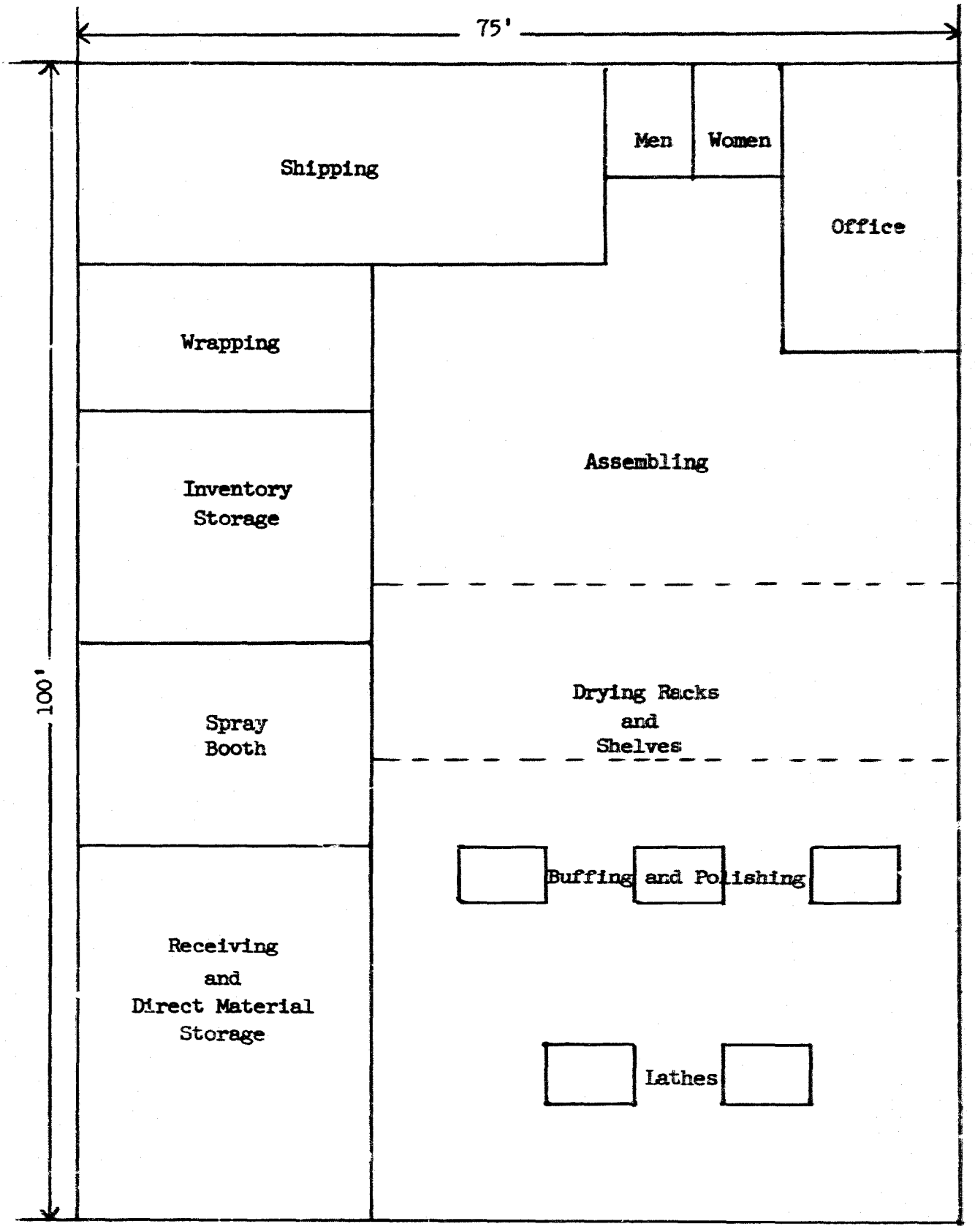
## SHORT TERM BANK CREDITS

1. Has it been possible to make arangements with local banks to finance short-time working capital requirements of the business?

## FINANCIAL PLAN

1. Has a definite plan to finance the project been worked out?
   A. Is sufficient capital available locally?
   B. If not, what is the plan to obtain the required capital?

Plant Layout



## GLOSSARY

| | |
|---|---|
| Base | The lowest portion of a lamp. |
| Break | That portion of a lamp located immediately above the base |
| Finial | A decorative small piece of brass which is screwed on the top of the harp to hold the shade in place. |
| Fount | The portion of a lamp located immediately above the break. |
| Harp | The brass plated form or frame on which the shade rests. |
| Seating Ring | A thin piece of brass placed between the principal sections (base, break, and fount) which assists in holding them firmly in place.<br><br>NOTE: See illustrations of above on page 28. |
| Chuck | A form made of either metal or hardwood against which a rotating disk of sheet metal is pressed or molded to obtain the desired shape. |
| Loader | An unfinished piece of gray iron cut to fit inside of the base. Its purpose is twofold; (1) it provides the weight needed in a hollow base, and (2) it acts as an anchor to which the piece of threaded pipe running through the break and fount is fastened. |
| Slush Mold | A metal mold into which molten white metal is poured to produce certain sections of a brass lamp. |
| Spray Booth | An enclosed ventilated area in which all sections of a brass lamp are sprayed with a coating of lacquer prior to being assembled as a finished lamp. See illustration on page 29. |
| White Metal | A zinc alloy containing copper and some aluminum which is heated to molten form and poured into a slush mold to produce various sections of a brass lamp. |

# BIBLIOGRAPHY


## Textbooks

"A Practical Manual of Industrial Finishes." B. M. Letsky, 251 pp.
Reinhold Publishing Corporation
430 Park Avenue
New York 22, New York

"Electroplating and Corrosion Prevention"
E. Molloy, 278 pp.
George Newnes Limited
Tower House, Southampton Street
Strand, W. C. 2,
London, England

## Periodicals

"Lamp Journal"
Rosenthal & Smythe, Inc.
101 Springfield Ave.
Summit, New Jersey

"Metal Finishing"
Metals and Plastics Publications, Inc.
381 Broadway
Westwood, New Jersey

"Materials in Design Engineering"
Reinhold Publishing Corp.
430 Park Ave.
New York 22, New York

"Industrial Finishing"
Practical Publications, Inc.
1142 N. Meridian Street
Indianapolis 4, Indiana

"Machinery"
Industrial Press
93 Worth Street
New York 13, New York

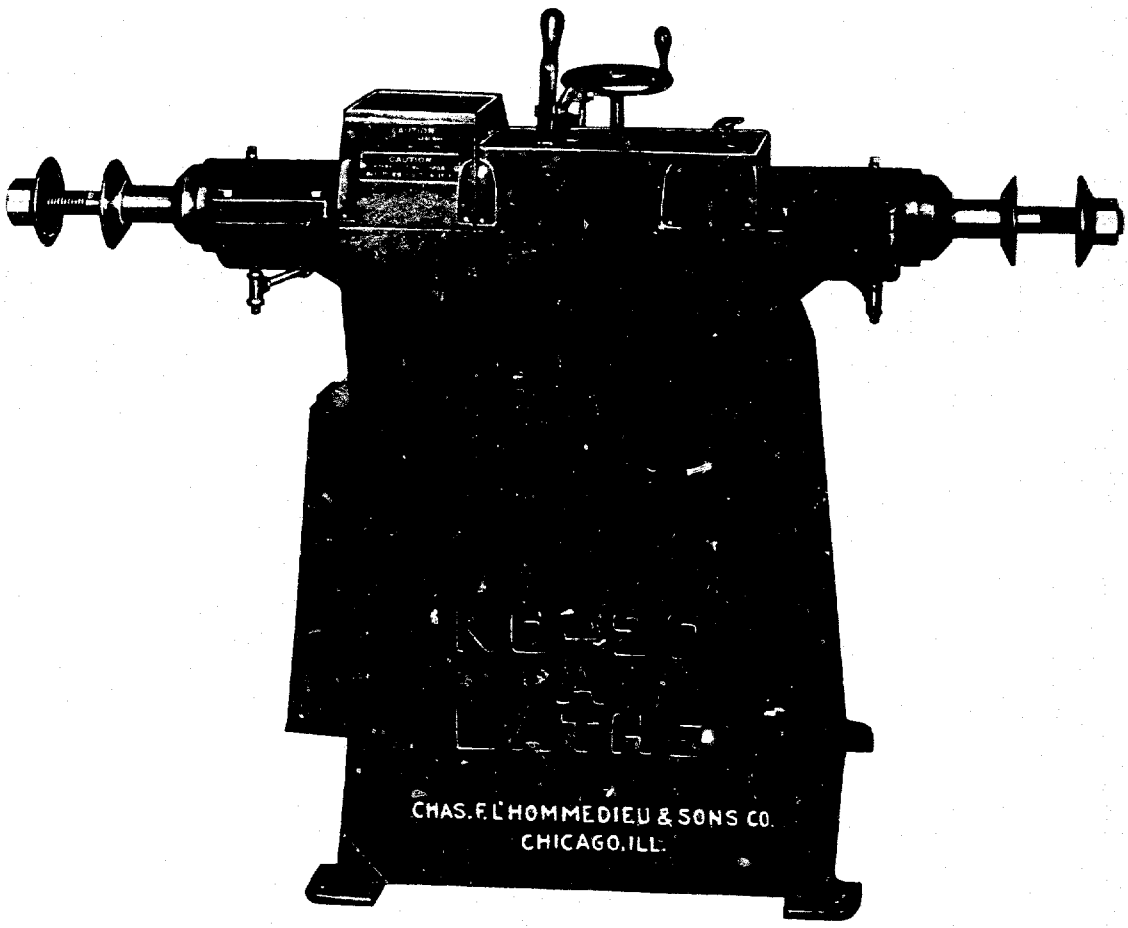



Figure 1

Polishing and Buffing Lathe

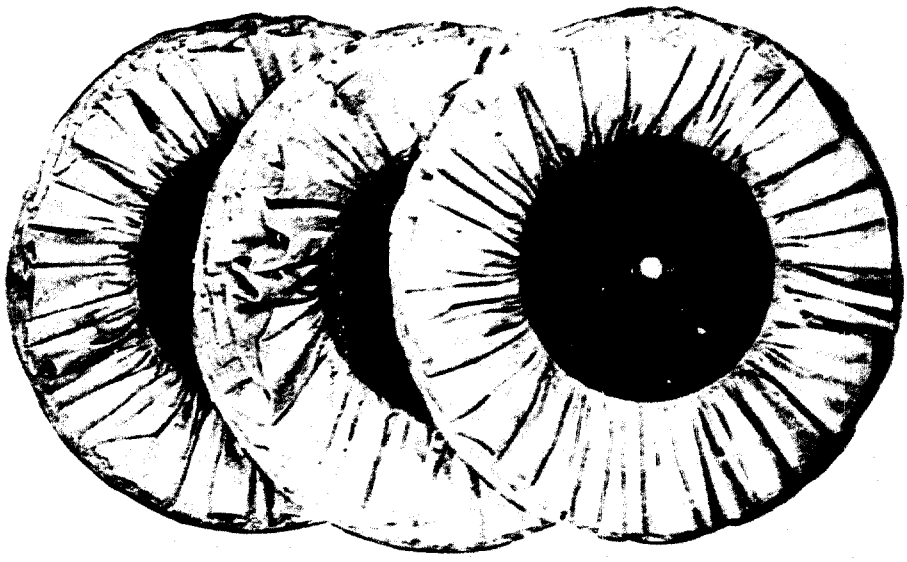


**Figure 2**

**Cotton Buffs**

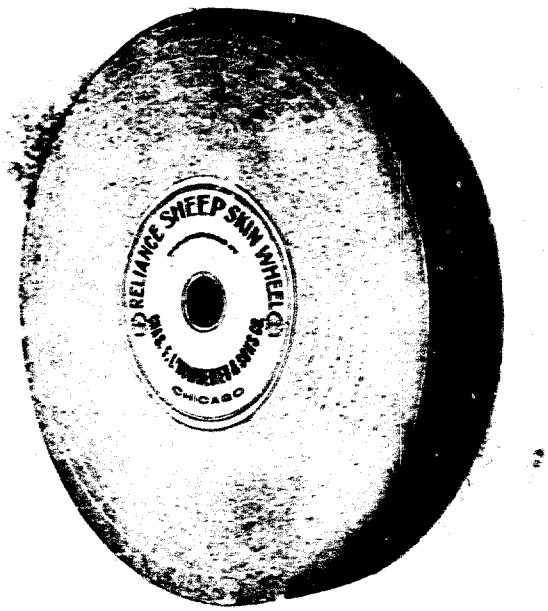



**Figure 3**

**Sheepskin Polishing Wheel**

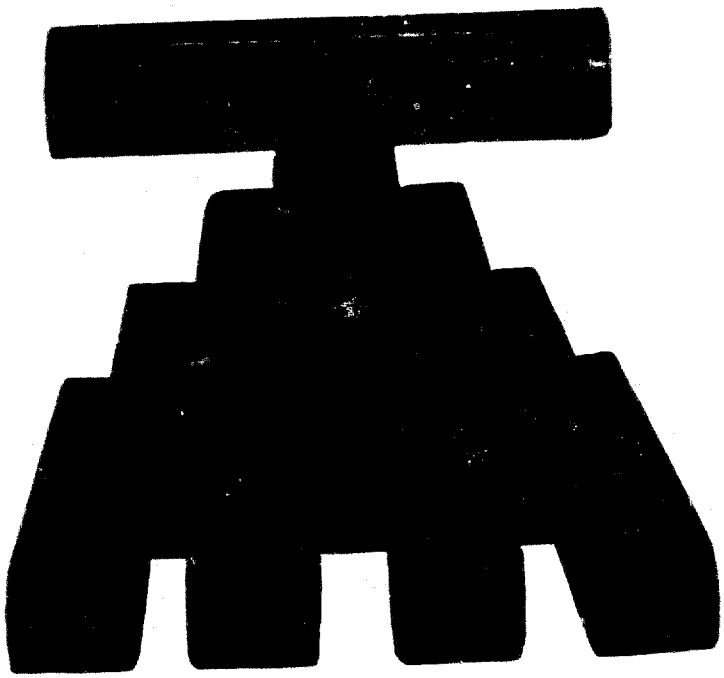


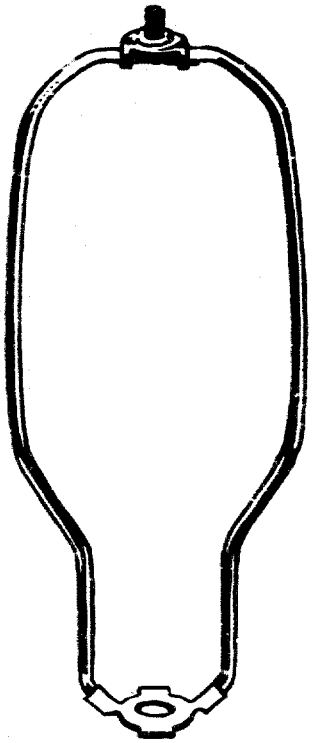
Figure 4

Buffing and Polishing Composition

Finial

Lock nut

Seating Ring



Harp

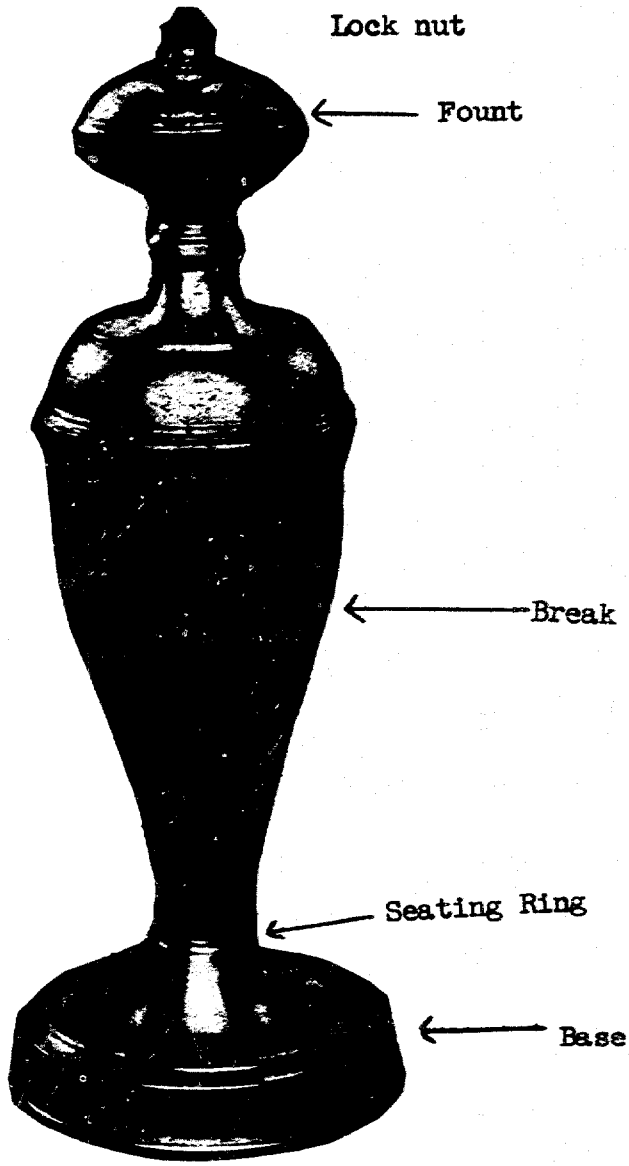
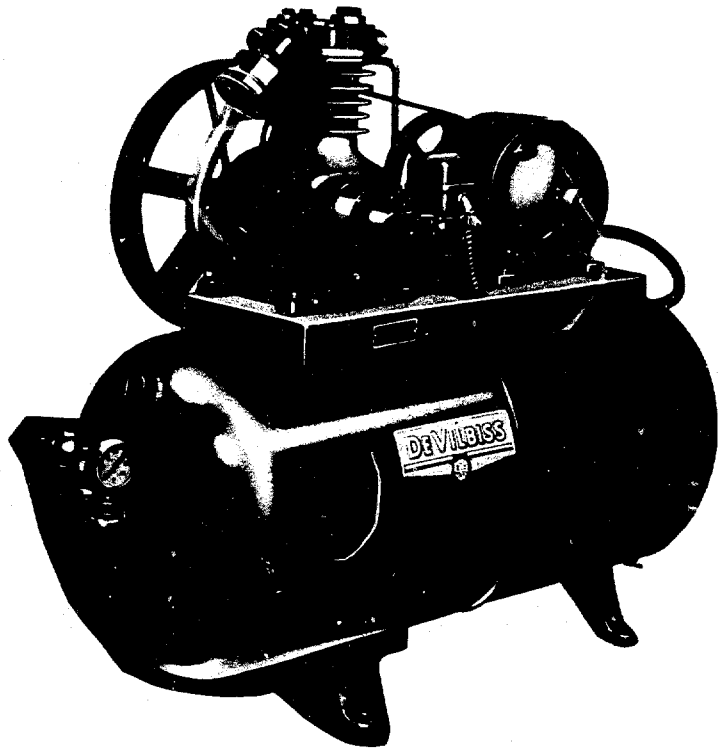
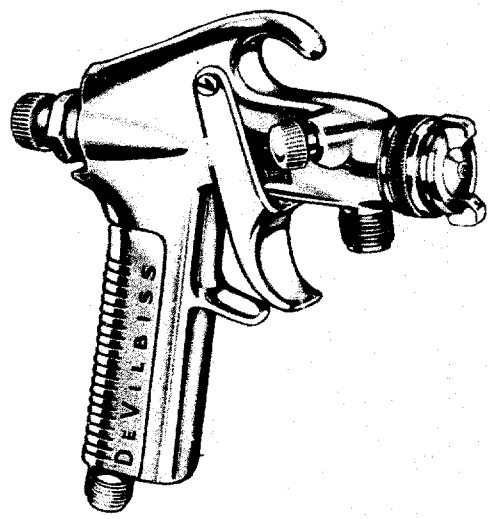



Figure 5

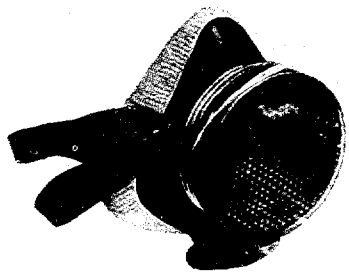
Brass Lamp - Component Parts



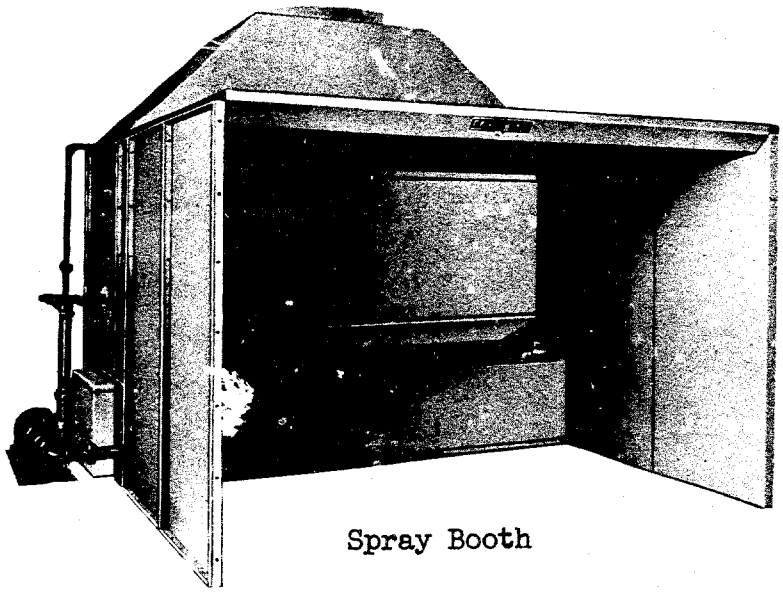

Air Compressor




Spray Gun



Respirator



Spray Booth

Figure 6

Spray Booth and Related Equipment

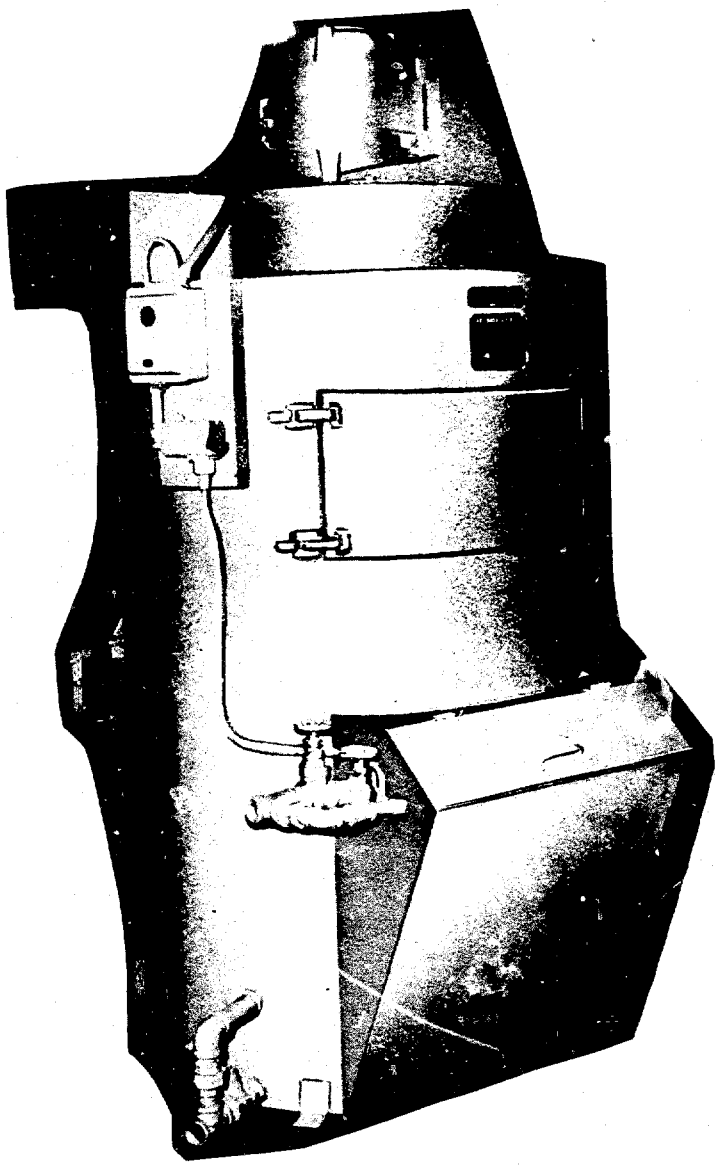


Figure 7

Dust Collector