AMERICAN GRINDING WHEELS

AMERICAN EMERY WHEEL WORKS

PRINTER'S ERRORS

Page 11 (third and last paragraphs)
"pages 26 and 27"
Corrected to pages 28 and 29

Page 17 line 20
"page 18"
Corrected to page 20

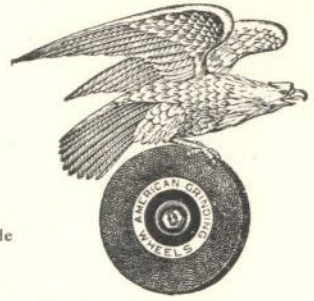
Page 27 last paragraph
"pages 26 and 27"
Corrected to pages 28 and 29

Page 43
"page 28"
Corrected to page 30

Page 103
CORRECT LIST PRICE ON
Farrell Foundry Co. Roll Grinder
Wheel 18" x 1⅝ x 12/12¼ is $23.85

Page 123 (Index)
ADDITION
Speed Tables. Page 21

"AMERICAN"
GRINDING WHEELS

Trade  Mark

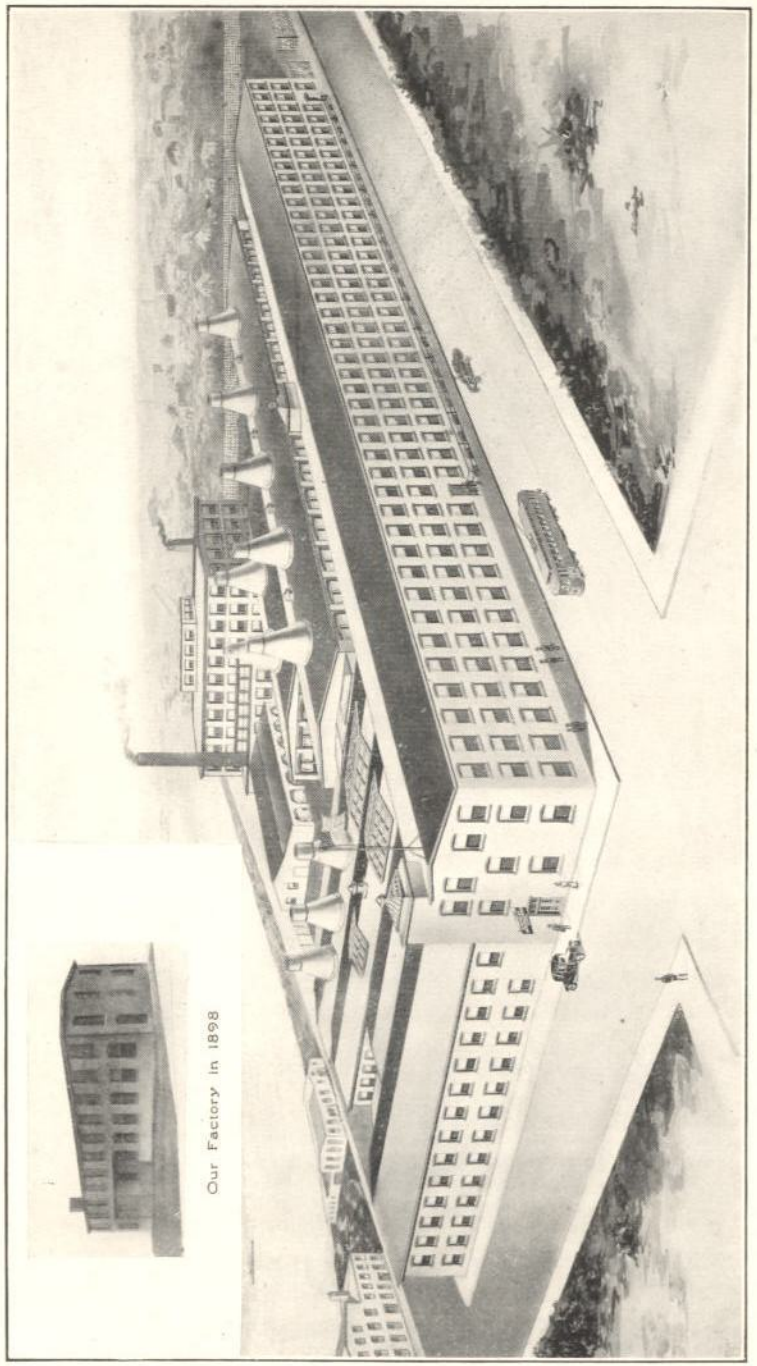
1920 EDITION

CABLE ADDRESS: "AMERY"

CODES USED:

A. B. C. 5th EDITION
WESTERN UNION
LIEBER'S FIVE LETTER
OUR OWN

AMERICAN EMERY WHEEL WORKS
PROVIDENCE, RHODE ISLAND, U. S. A.



GRINDING WHEEL PLANT

FOREWORD

EVER since this company was founded, twenty-five years ago, we have known only the motive to produce the best possible grinding wheels. We have based our actions on the belief that you cannot buy the good will of a customer; that our product must earn good will by reason of its quality, by the methods under which it is sold and by the service our organization renders to its customers.

We have always based our expectations of future business on the solid foundation of service rendered by an honest product truthfully presented. From a small beginning this company has grown to be an important factor in the production of the world's supply of grinding wheels. The credit for this growth must be due to the uniform high quality of our product, and to the responsible business principles we have always endeavored to follow.

Only the best materials are used in the manufacture of our wheels. All materials are tested in our laboratory in order to maintain our standards. Tests of new materials and methods are constantly being made with the endeavor to still further improve our product, while grinding operations, automatic and hand, are carried on in our factory to determine the most efficient kind, grain and grade of wheels for different operations.

Using the three best known processes of manufacture; namely, the vitrified, the silicate and the elastic, together with our standard abrasives, we can and do manufacture the whole range of sizes from the tiny ½″ diameter jewelers' wheels to giant wheels measuring 48″ in diameter and 12″ thick and weighing nearly a ton each. Innumerable combinations of grain size and grade of hardness are made to abrade materials ranging from feathers to the hardest of alloy steels. The fact that we carry over 300,000 finished wheels in stock in order to meet the ordinary requirements of our customers gives one some idea of the varied demand we endeavor to meet.

It is with pleasure that we acknowledge our debt of gratitude to the large number of prominent manufacturers of grinding machinery who have for many years equipped their grinders with our wheels, and who have given us the benefit of their experience; and to the dealers who, acting as our agents, have so ably assisted us in the sale of our product.

Main Office and Works
PROVIDENCE, RHODE ISLAND, U. S. A.

Branch Office
PITTSBURG, PA., BESSEMER BUILDING

Dealers Handling American Grinding Wheels in the United States

Anderson, S. C	Sullivan Hardware Co.
Atlanta, Georgia	Seeger Machine Tool Co.
Baltimore, Md	Kemp Machinery Co.
Boston, Mass	Chase, Parker & Co.
Buffalo, N. Y	Beals, McCarthy & Rogers, Inc.
Chicago, Ill	Grinding Wheel Sales Co.
Cincinnati, Ohio	Queen City Supply Co.
Clarksburg, W. V	Williams Hardware Co.
Cleveland, Ohio	E. D. Bishop Wholesale Co.
Detroit, Michigan	Chas. A. Strelinger Co.
Erie, Penn	United Hardware & Supply Co.
Gadsden, Alabama	Gadsden Hardware & Supply Co.
Greensboro, N. C	Odell Hardware Co.
Hartford, Conn	L. L. Ensworth & Son
Lewiston, Maine	Hall & Knight Hardware Co.
Los Angeles, Cal	W. T. McFie Supply Co.
Newark, N. J	Jones & Auerbacher, Inc.
New Orleans, La	Oliver H. Van Horn, Inc.
New York, N. Y	Peter A. Frasse & Co.
Pawtucket, R. I	Wm. K. Toole Co.
Rochester, N. Y	~~Burke Steel Co., Inc.~~
San Francisco, Cal	Berger & Carter, Owners Pacific Tool & Supply Co.
Seattle, Washington	Seattle Hardware Co.
Shreveport, La	Buckelew Hardware Co.
Springfield, Mass	Chas. Millar & Son Co.
Syracuse, N. Y	C. H. Wood Co.
Titusville, Penn	United Hardware & Supply Co.
Toledo, Ohio	Coghlin-Kirkby Machinery & Supply Co.
Utica, N. Y	Chas. Millar & Son Co.
Waco, Texas	Archenhold Automobile Supply Co.
Wilmington, Del	Hudson Supply Co.

IN CANADA

Windsor, Ontario	Chas. A. Strelinger Co. of Canada, Ltd.

American Emery Wheel Works

EUROPEAN AGENTS

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Buck & Hickman, Ltd.
London, Manchester and Birmingham, England; Glasgow, Scotland

R. S. Stokvis & Fils
Paris, France

R. S. Stokvis & Fils
Brussels, Belgium

R. S. Stovkis & Zonen, Ltd.
Rotterdam, Holland

American Machinery Import Office
Zurich, Switzerland

V. Lowener
Copenhagen B, Denmark

Aktiebolaget V. Lowener
Stockholm, Sweden

V. Lowener's Maskinforretning
Christiania, Norway

La Maquinaria Anglo Americana
Barcelona, Spain

Maskin-Aktiebolaget E. Gronblom
Abo, Finland

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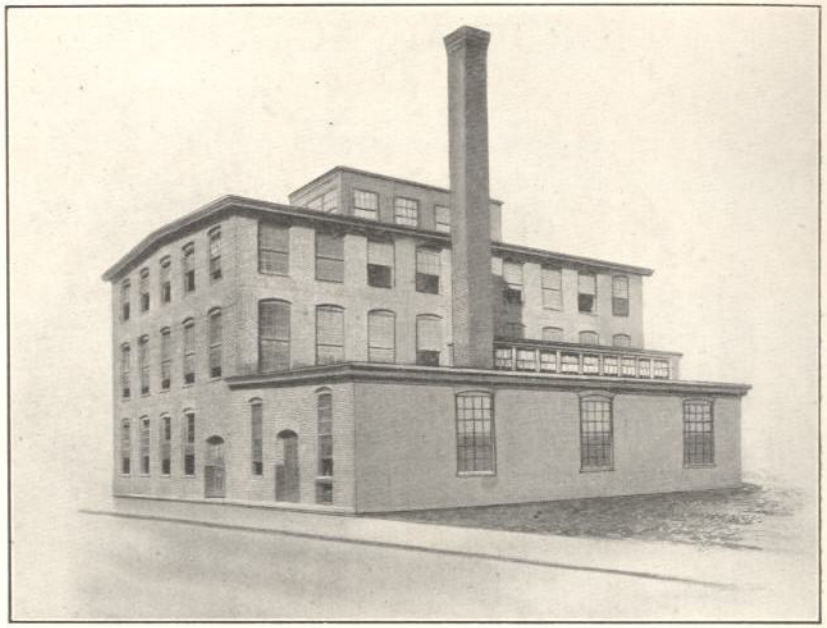
AUSTRALIAN AGENT

Bevan & Edwards Property, Ltd.
Melbourne and Sydney, Australia



CRUSHING, GRADING AND PURIFYING PLANT

WE are one of the very few grinding wheel manufacturers who operate a plant for crushing, grading and purifying abrasive ores and grains, in connection with their wheel factory. This unit gives us the decided advantage of being able to import abrasives in ore form and crush, wash, roast, treat magnetically, and grade them under our own careful supervision, thus obtaining grains which are free from impurities and of uniform size.

Our crushing plant does a great deal to help deliveries of grinding wheels and should be of interest to our customers for this reason. We are able at short notice to crush down and clean a small lot of any grain size of abrasive to fill a certain order. This eliminates the delay of ordering material from a distant crusher and awaiting delivery of grains before starting manufacture of wheels.

We crush to the whole range of sizes, from No. 8 grain, which is about the size of a one-half carat diamond, to a grain finer than flour. As our wheel factory uses very little grain finer than No. 90, we have considerable quantities of abrasive grain from No. 100 down to the various sizes of flour, which we sell to optical lens manufacturers, plate glass makers, silversmiths, jewelers, and to many other users of high quality abrasive "fines." We are at all times glad to furnish samples and prices of this material upon application.

ABRASIVES

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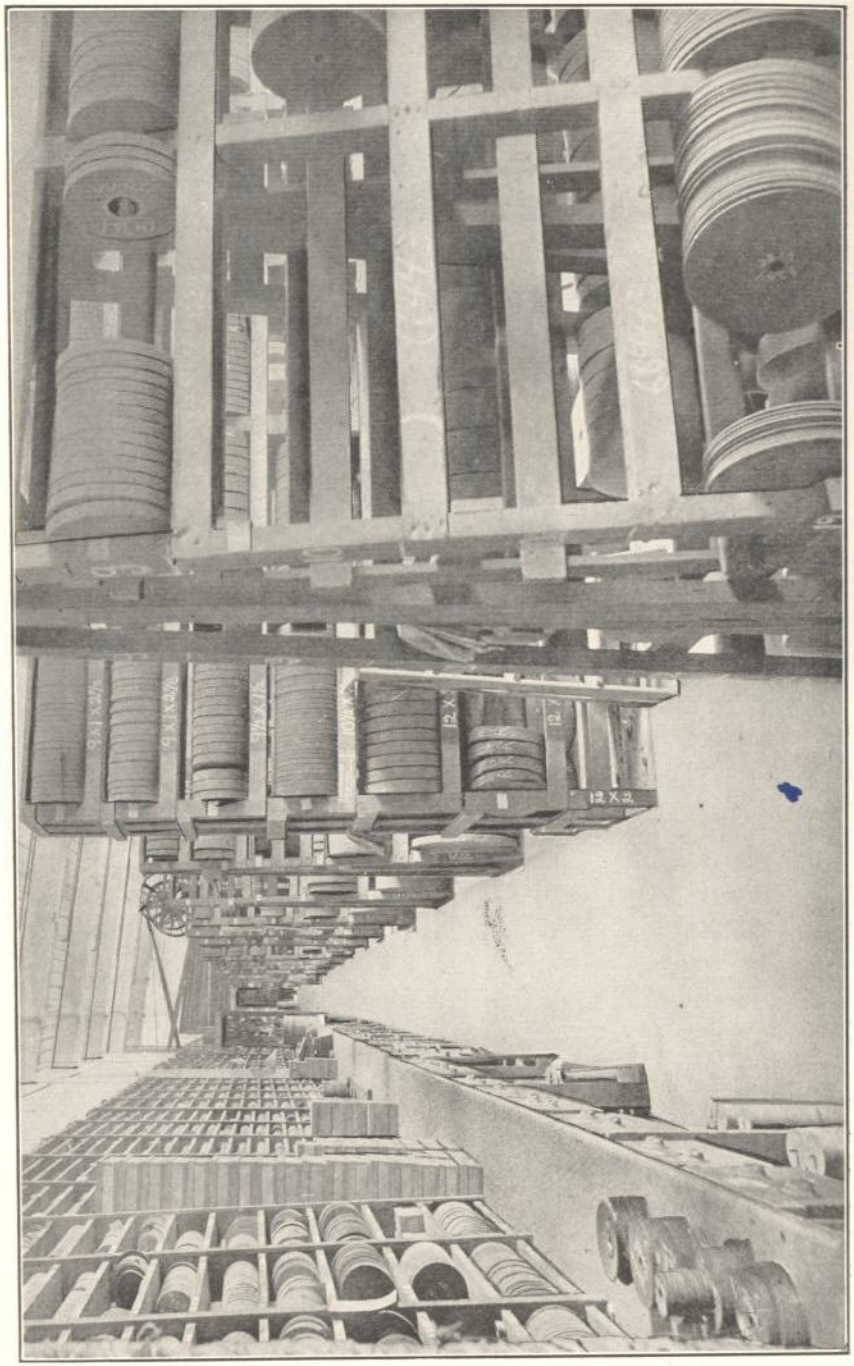
THE principal qualifications of an abrasive are hardness, toughness, fracture, absence of impurities, and uniformity. By fracture is meant the propensity to break along planes, leaving sharp cutting edges, instead of leaving rounded, dull edges. Uniformity of the physical and chemical properties of an abrasive is necessary if uniform wheels are to be obtained.

While poor wheels can be made of good abrasives, good wheels cannot be made of poor abrasives.

No one abrasive excels in all five of the qualifications enumerated, and we therefore use four abrasives—Electric Furnace Corundum (Artificial Corundum), Natural Corundum, 77 Corundum, and Carbolite. One contains properties which make it best for wheels for certain kinds of grinding, while another produces wheels best suited for other grinding operations.

Having the various abrasives best adapted for making wheels for different forms of grinding, it is of the utmost importance that these abrasives be of a constant degree of purity. All abrasives in the crude form, as well as many abrasives in the grain form, artificial or natural, contain varying amounts of impurities. The slightest variation in the chemical analysis of an abrasive will render it impossible to make uniform wheels. To remove these impurities we have a separate building with the necessary equipment, consisting of washing machines for removing dirt; roasting ovens operated at an intense heat for burning out ferro-silicon, iron, and other substances; powerful electro-magnets for removing even weakly magnetic materials; and acid baths.

CORUNDUM *(Oxide of Alumina—Al_2O_3)*. Electric Furnace Corundum is produced in the electrical furnace from bauxite or other materials high in alumina contents, and is the material used in making the larger part of our wheels. Natural Corundum, as the name implies, was formed by nature. In a transparent and colored form it includes such gems as the ruby and the sapphire. There are many poor natural corundums on the market, and for this reason there are some people who are prejudiced against all natural corundums, but tests have shown that for many grinding operations wheels made of the best natural corundum are the most efficient.



SECTION OF OUR STOCK ROOM (Wheels in Semi-Finished Condition)

ABRASIVES (Continued)

Electric furnace corundum is tougher than the natural corundum, but does not fracture so easily. Therefore, wheels made of the artificial corundum are best for the heavier, rougher forms of grinding, while for operations where the finish is more important than the rapid removal of material, wheels made of natural corundum should be used. To avoid confusion we term wheels made of either artificial or natural corundum "Corundum" wheels. In filling orders we supply wheels made of the kind of corundum that tests and experience have shown is best for the operation for which the wheels are to be used. In some cases a wheel made of both artificial and natural corundum is best, and in such cases these wheels are furnished.

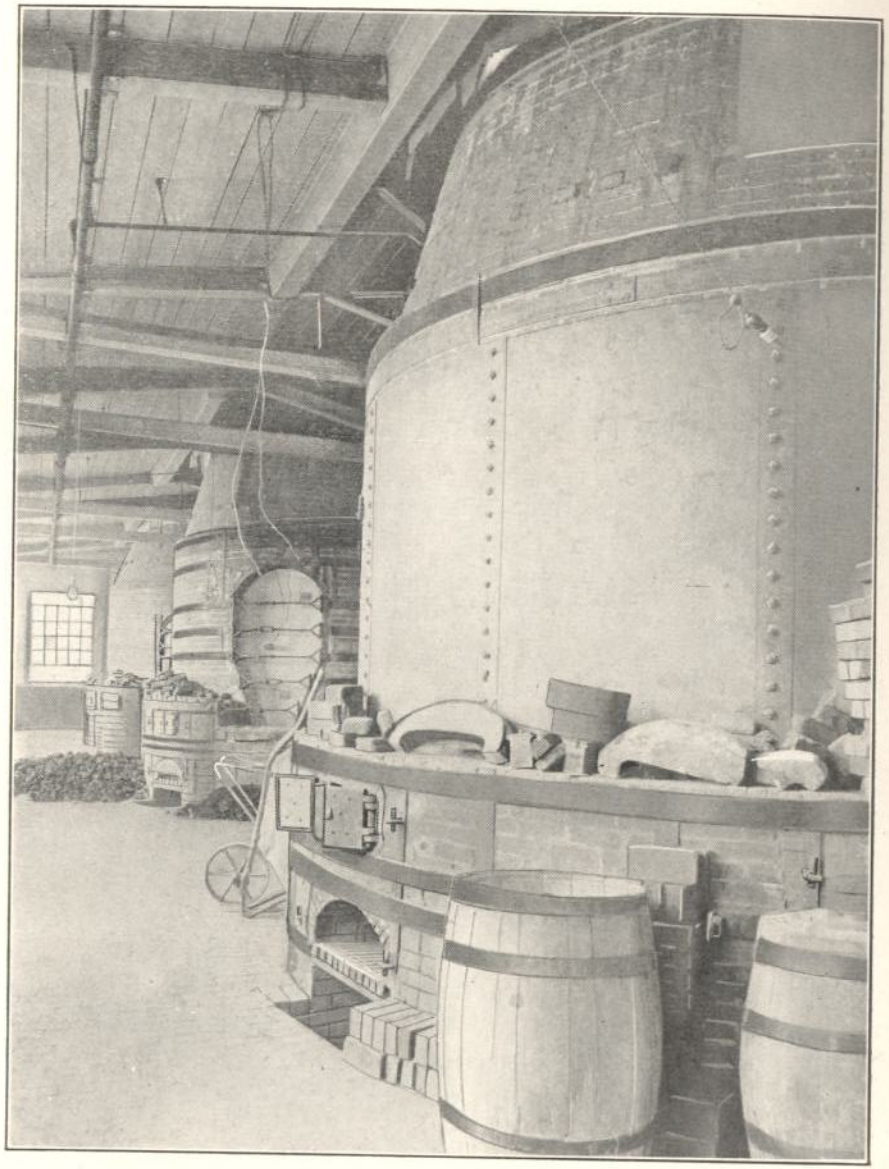
NO. 77 CORUNDUM is a corundum that is particularly high in crystalline alumina and that is subjected to treatment whereby it is refined to a very high degree. Wheels made of No. 77 Corundum are especially suitable for automatic and precision grinding. They are identified by using the figure 77 before the grain size. Thus, a wheel No. 7760 would be a wheel made of No. 77 Corundum, grain size No. 60.

Our Corundum and No. 77 Corundum wheels are most efficient for grinding steel and, in general, all materials of high tensile strength. (See pages ~~28~~ and ~~32~~).

CARBOLITE *(Carbide of Silicon—SiC.)*. Carbolite is an electrical abrasive. Strange as it may seem to the layman, it is made from coke, sand, sawdust and salt. These materials when heated in the electric furnace form Crystalline Carbide of Silicon. It is extraordinarily hard and sharp, and while not tough as compared with other abrasives, its very brittleness makes it the best abrasive for certain operations.

For grinding cast iron, brass, and other metals of low tensile strength, our Carbolite wheel will give the best results.

They are also most efficient for grinding aluminum, pearl, granite, marble, rubber, and some forms of glass. (See pages ~~25~~ and ~~27~~).
28 29



SECTION OF OUR KILN DEPARTMENT
Showing types of Kilns used to manufacture
our Vitrified Wheels

American Emery Wheel Works

AMERICAN VITRIFIED WHEELS

THE most commonly used grinding wheels are bonded by the vitrified process.

The method of manufacture is similar to that used in making pottery wares. Bonding clays and abrasive grains are carefully proportioned according to secret formulae to obtain a certain grade of hardness.

We use two methods in shaping or molding the wheels: some are tamped from an almost dry mixture, but ninety-nine per cent of them are mixed mechanically in "puddlers" in a fluid form, poured into molds, thoroughly dried, and spun to shape on potters wheels. The latter method produces a more uniform product.

The "green" wheels are then carefully packed with ground quartz in containers made of fireclay and placed in kilns.

The kiln is sealed and the fires started, the heat being increased gradually hour by hour until approximately 3000° Fahrenheit is obtained. This completes the vitrification and the heat is then decreased with the same careful precision until the wheels are entirely cooled. This one step in making vitrified wheels consumes seventeen days.

Heat treatment has such an important bearing on the quality of the wheel that we equip our kilns with electric pyrometers, as well as pyrometric cones, to enable us to absolutely maintain a standardized hourly schedule of heat during the entire firing.

Vitrified wheels are not affected by heat, cold, water, oils or acids. Their texture is porous but uniform. They contain no hard or soft places and are rapid and cool cutting.

We designate the grades of hardness of our vitrified wheels by the letters of the alphabet.

MOULDING SILICATE WHEELS

OVENS IN ELASTIC WHEEL DEPARTMENT

AMERICAN SILICATE WHEELS

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GRINDING wheels manufactured by the silicate process derive their name because of the fact that silicate of soda forms the principal bonding material.

They are baked in specially constructed ovens at a comparatively low temperature.

Silicate wheels are extremely rapid cutting, even in hardness and perfectly balanced. We make them either porous or close formation as the character of the grinding job requires.

Being waterproof, they are especially suitable for wet grinding operations. We also recommend them for surface grinding on high speed steels and in other cases where the utmost nicety of grinding is required.

Grades of hardness are designated by the numerals.

AMERICAN ELASTIC WHEELS

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CERTAIN grinding operations, such as cutting-off or slotting, demand a wheel very thin compared to its diameter, but which must have great strength and also a certain amount of elasticity.

To obtain this quality in a wheel, we use flaked shellac for the bond. This shellac is heat treated by a secret process, combined with the abrasive grains, pressed in a mold of the required size and then baked in a special gas oven.

By this process, wheels may be made as thin as 1/32″ up to 6″ diameter, 1/16″ up to 12″ diameter and 1/8″ up to 16″ in diameter.

Grades of hardness of AMERICAN elastic wheels are desginated by the numerals followed by the letter "E."

AMERICAN EMERY WHEEL WORKS
PROVIDENCE, R. I. U. S. A.

Report of Wheel Tested *19*

I ..... *hereby certify that the following wheels have been revolved at the speed indicated against each item respectively, and have satisfactorily withstood the test, without developing any indication of weakness or other defect.*

Quantity	Diam.	Thickness	Hole	No. Emery	No. Cor.	Grade	No. of Rev. Per Min.	Shop Order Number	Requisition Number	FOR

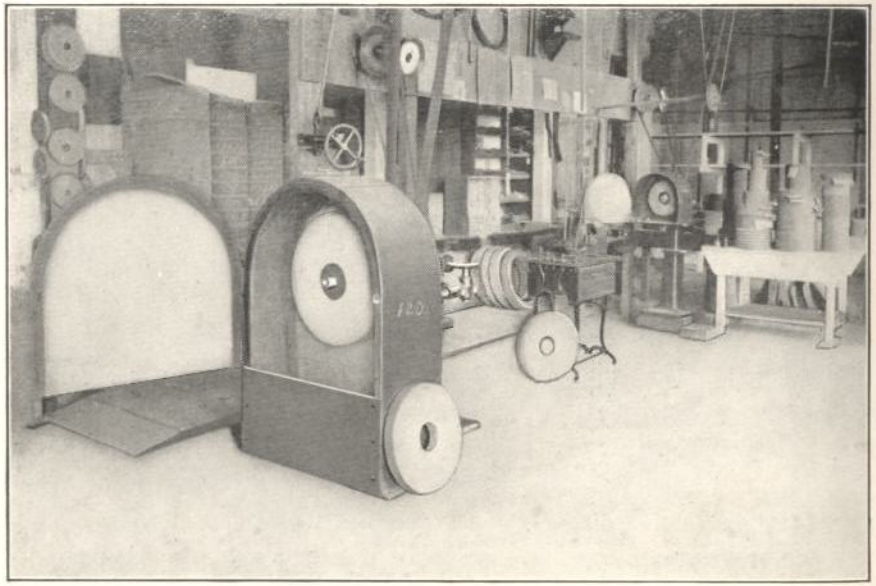
..... *Inspector.*

Personally appeared before me the said .....

this ..... *day of* ..... *19* *, and made oath that the above statement is just and true to the best of his knowledge and belief.*

..... *Notary Public.*

FACSIMILE OF TESTING SHEET



TYPES OF SPEED TESTING MACHINES
They Prove the Safety of AMERICAN Grinding Wheels

TESTING FOR SAFETY

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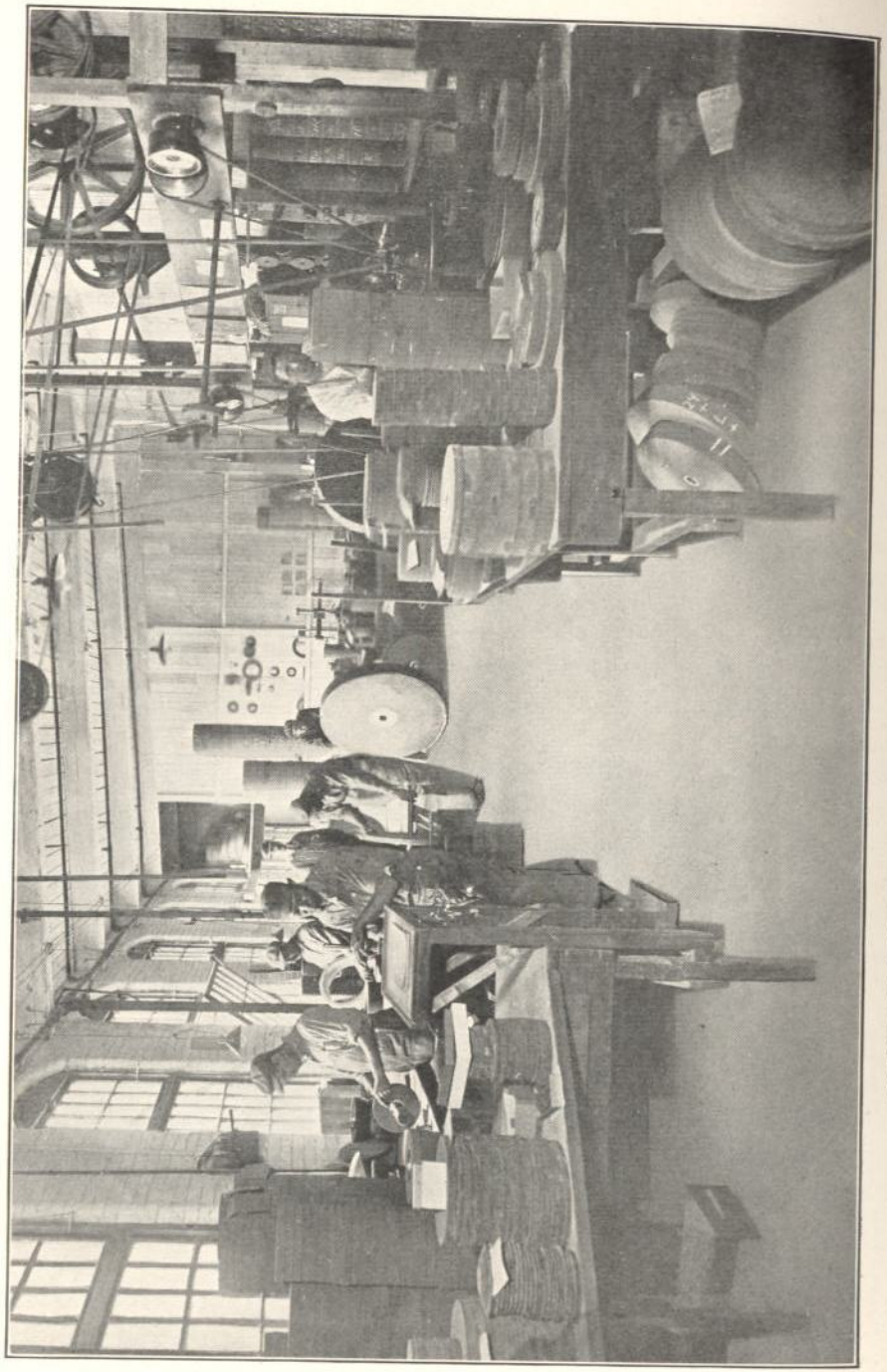
BECAUSE wheels must cut and consequently wear away slowly, they cannot be made as strong as steel or cast iron. They are, therefore, subject to breakage from accident or misuse. On this account it is necessary for us to know for a certainty that no wheels containing flaws, or that are in any way weak or defective, leave our factory. Our system of testing makes it impossible for any wheel not amply strong to be shipped.

Wheels are tested previous to shipment on special machines whereby any desired speed may be obtained and recorded. This work is done by responsible men, who make a record of each test by filling out a Testing Sheet, facsimile of which is shown on opposite page. Each wheel is marked at the speed at which is was tested, and no wheel can be shipped unless so marked. The testing sheets are filed for reference. When so desired, we furnish a testing sheet sworn to before a Notary Public.

Wheels are tested at a speed that gives a stress more than double the strain given when the wheel is run at the normal operating speed. If a wheel is defective it will surely break when tested.

Wheels may be damaged by rough handling in transit, or after unpacking. It is, therefore, desirable to tap a wheel lightly with a hammer before mounting. If it is cracked, the fact may be determined by the sound.

We especially call attention to the table on page 20 giving common causes of breakage. If these causes are eliminated we confidently guarantee the safety of AMERICAN grinding wheels.



CORNER IN OUR TESTING DEPARTMENT (Devoted to Testing for Grade and Balance)

TESTING FOR GRADE

(Introducing Our Mechanical Grader)

NO matter how good material may be used, or how well it may be made, a wheel will not give the best results if it is not of the right grade of hardness for the work for which it is intended. It is, therefore, highly essential that no wheel be approved and shipped that is not of the exact grade desired. Every wheel is compared with standard grading blocks. We use two methods in making this comparison, called hand grading and mechanical grading.

Up to the present time it has been the universal practice to prove the grade of a grinding wheel by hand with a tool called a "digger." On the harder grades this method has been entirely satisfactory, and will be continued by us.

Vitrified wheels softer than Grade M, as well as silicate and elastic wheels up to grade 3, must be absolutely true to even the fractional variations of a single grade. It is impossible to consistently grade as fine as this by hand. To detect these slight variations we have perfected a highly sensitive mechanical grader which is set from the grading blocks and will register differences between block and wheel as slight as one-sixteenth of a grade.

A most complete record of every wheel that we make is kept and filed in numerical order in fire-proof vaults. This record shows the exact kind, quantity and proportion of each material that enters into the wheel, the detailed method or process of manufacture, and in the case of vitrified wheels, the number of the heat in which the wheel is vitrified. Our heat records show the exact location of each wheel in the kilns.

When wishing to make wheels the same as some previous wheel, we can duplicate in every detail the conditions under which the previous wheel was made. Our system of testing is a check against any possible mistake. It also enables us to determine and match any sample sent us, or to furnish wheels slightly harder or softer than the sample, if so desired.

TESTING FOR BALANCE

EVERY wheel must be in perfect balance before it goes into the shipping room. Wheels are tested for balance by putting them upon accurate balancing ways. Any wheel that is out of balance and cannot readily be put in balance by returning it to the truing-room, is thrown out.

COMMON CAUSES OF BREAKAGE

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Cracked wheel (caused by)

- Rough handling in transportation
- Dropping or striking against some object while not being operated ...
  - During storage
  - While being mounted
  - While standing
- Being forced on improper sized spindle.....
  - Too small bushing
  - Too large spindle
- Heated spindle..... — Tight bearings
- Only one flange, nut against wheel
- Uneven bearing of flanges.....
  - Bent or broken flange
  - Bushings projecting beyond sides of wheels
  - High spots on flanges
  - High spots on wheels
- Flanges of different diameters
- Flanges not properly relieved
- Fault of compressible washers.....
  - Missing
  - Too thin
  - Too small diameter
- Tightening of nut too hard
- Hacking of wheel
- Screwing wheel on taper arbor

Too high rim speed (caused by).....

- Spindle overspeeded.....
  - Overspeed when first set up
  - Speed increased—Desire for increased cutting
  - Use of cone pulley—Shifting to small pulley
- Use of too large wheel for spindle speed.....
  - Wheel initially too large
  - Too large wheel substituted
  - Wheel of different grain and lower recommended speed substituted
  - Wheel of different shape substituted
  - Wet wheel substituted

Catching work between rest and wheel (caused by).....

- Improper adjustment of rest
- Improper handling of work.....
  - Side grinding when rest not designed for it
  - Pushing work under rest

Out of true (caused by)....

- Loose bearings
- Bent spindle
- Loose frame
- Rough or improper use

Unbalanced wheel (caused by).....

- Wheel standing in water
- Side grinding
- Wheel untrue

Weakened wheel (caused by).....

- Side grinding
- Hacking wheel

Too small spindle (caused by)..... — Wheel spindle used for size of wheel

Side grinding on improper wheel (caused by).....

- Lack of proper equipment
- Inexperience of men

American Emery Wheel Works

SPEED FOR WHEELS

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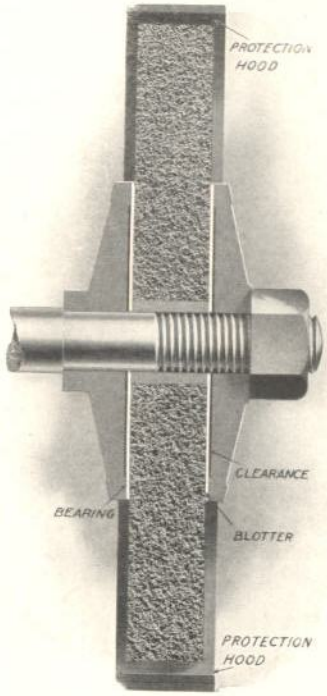
THE table given below designates number of revolutions per minute for specified diameters of wheels, to cause them to run at the respective periphery rates of 4,000, 5,000 and 6,000 feet per minute.

Diam. Wheel	Rev. per Minute for Surface Speed of 4,000 ft.	Rev. per Minute for Surface Speed of 5,000 ft.	Rev. per Minute for Surface Speed of 6,000 ft.
1 inch	15,279	19,099	22,918
2 "	7,639	9,549	11,459
3 "	5,093	6,366	7,639
4 "	3,820	4,775	5,730
5 "	3,056	3,820	4,584
6 "	2,546	3,183	3,820
7 "	2,183	2,728	3,274
8 "	1,910	2,387	2,865
10 "	1,528	1,910	2,292
12 "	1,273	1,592	1,910
14 "	1,091	1,364	1,637
16 "	955	1,194	1,432
18 "	849	1,061	1,273
20 "	764	955	1,146
22 "	694	868	1,042
24 "	637	796	955
26 "	586	733	879
30 "	509	637	764
36 "	424	531	637
42 "	364	455	546
48 "	318	397	477
54 "	283	354	425
60 "	255	319	383

The medium of 5,000 feet is usually employed in ordinary work, but in specific cases it is sometimes desirable to run them at a lower or higher rate according to requirements.

We recommend a number of revolutions equivalent to a surface speed of 5,000 feet. This does not indicate that they cannot be run at higher or lower speed, but that it is a good average speed to produce good results. To allow an ample margin of safety, it is recommended that wheels should not be run at a surface speed exceeding 6,000 feet.

Every shop should have a speed indicator in order that the speed of its grinding machinery may be known.



METHODS of MOUNTING GRINDING WHEELS

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WE recommend the method of mounting grinding wheels illustrated herewith as superior to any other.

The grinding machine should be of rigid construction, with large spindles, well fitted bearings and securely fastened on firm foundations. A protection hood should surround the wheel.

See that the wheel slides freely on the arbor. It is dangerous to force a wheel on to the arbor, since the latter may become heated and expand enough to crack the wheel.

The holes in the wheels should be bushed .005″ larger over standard size spindles. This permits the wheel to slide on the spindle without cramping and insures a good fit not only on the spindle, but against the inside flange, which is essential.

The following sizes of spindles are recommended.

Diameter in Inches	Thickness of Wheel in Inches																	
	¼	⅜	½	⅝	¾	1	1¼	1½	1¾	2	2¼	2½	2¾	3	3¼	3½	4	4½	5
6	½	½	½	½	½	½	⅝	⅝	¾	¾	¾	¾	¾	¾	¾	¾	1	1	1
8	½	½	½	½	½	½	⅝	⅝	¾	1	1	1	1	1	1	1	1¼	1¼	1¼
10	⅝	⅝	⅝	⅝	½	½	⅝	⅝	1	1	1	1¼	1¼	1¼	1¼	1¼	1¼	1½	1½
12	¾	¾	¾	¾	¾	1	1	1	1	1	1	1¼	1¼	1¼	1¼	1¼	1½	1½	1½
14	⅞	⅞	⅞	⅞	1	1	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1½	1½	1½	1½	1½	1½
16					1¼	1¼	1¼	1¼	1¼	1¼	1½	1½	1½	1½	1½	1¾	1¾	1¾	1¾
18					1¼	1¼	1¼	1½	1½	1½	1½	1½	1½	1½	1¾	1¾	1¾	1⅞	1⅞
20						1½	1½	1½	1½	1½	1½	1½	1¾	1¾	1¾	1⅞	1⅞	1⅞	1⅞
24						1½	1½	1½	1¾	1¾	1¾	1¾	1¾	1¾	2	2	2	2	2
26							1½	1½	1¾	1¾	1¾	1¾	2	2	2	2	2¼	2¼	2¼
30								1¾	1¾	2	2	2	2	2	2¼	2¼	2½	2½	2½
36									2	2¼	2¼	2¼	2½	2½	2½	2¾	3	3	

FLANGES

Flanges at least one-half the diameter should be used; never less than one-third. They should be relieved with true bearing at the outer edge, and the inner flange always be fixed on the spindle; never loose.

Tighten flanges only enough to hold wheels firmly, avoiding any unnecessary strain. Never, under any circumstances, mount wheels without flanges.

TAPER SIDE WHEELS

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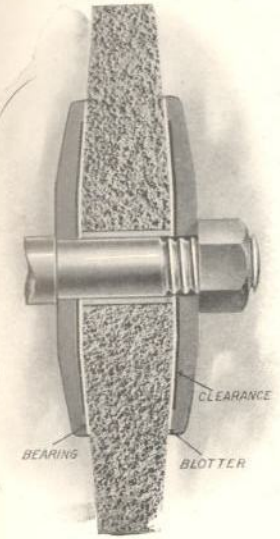

WHEELS with bevelled or tapered sides as illustrated herewith, supplied when desired. We also supply the protection flanges of this type. Wheels of any other shape for special styles of flanges supplied, providing design of wheel and flanges is in accordance with the Safety Code adopted by the Abrasive Wheel Manufactures of United States and Canada.

In ordering tapered side wheels, state clearly whether tapered one or both sides, thickness of wheel at arbor hole, thickness of wheel at face, and *diameter of "flat spot" on the side of the wheel.*

WASHERS OR PADS

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Compressible washers of pulp or rubber, slightly larger than flanges, should be used between the wheel and the flanges. For this purpose we label AMERICAN wheels with pads made of blotting paper. They distribute the pressure evenly when the flanges are tightened by taking up any irregularities in the wheel or the flange.

Never use blotters or pads of smaller diameter than your flanges. If the blotters furnished with the wheel are smaller than your flanges, ask us to send you larger blotters, stating the size of the flanges used.

EXPLANATION OF GRAIN AND GRADE

THE grain and grade of a grinding wheel determine its efficiency for the work it has to do.

Grain means the size of abrasive used to make a grinding wheel. The size of grain is determined by the number of meshes per lineal inch of screen through which the abrasive is passed. For example, a No. 30 grain is a particle of such size that it will just pass through a screen having 30 meshes per lineal inch or 900 meshes per square inch.

Our standard grains are 10, 12, 14, 16, 20, 24, 30, 36, 46, 54, 60, 70, 80, 90, 100, 120, 140, 150, 180, 200, and 220, with flours designated as F, 2F, 3F, 4F and SF. The lower numbers indicate the coarser grains, the higher numbers the finer ones.

For certain grinding operations, particularly cylindrical grinding, we use a combination of three or more sizes of grain, a mixture of fine, coarse and medium sizes. This is called a combination wheel.

The term grade is used to designate the degree of hardness of a wheel. The grade of a grinding wheel is of equal importance with the size of grain in obtaining the right wheel for any particular work. The degree of hardness is governed largely by the bonding material in which the abrasive grain is set.

American Emery Wheel Works

GRADE LIST OF AMERICAN WHEELS

THE following grade list designates the degree of hardness of our wheels, both Corundum and Carbolite. Note the different grade marks for our three processes of manufacture.

	Vitrified Process	Silicate Process	Elastic Process
Very Soft	G	½	½ E
	H	¾	¾ E
	I	1	1 E
Soft	J	1½	1½ E
	K	2	2 E
	L	2½	2½ E
Medium	M	3	3 E
	N	3½	3½ E
	O	4	4 E
Medium Hard	P	4½	4½ E
	Q	5	5 E
	R	6	6 E
Very Hard	S	7	7 E
	T		
	U		
Extra Hard	V		
	W		
	Z		

Each letter or numeral indicates one degree harder grade than the preceding letter or numeral.

For some very particular operations we furnish wheels of a hardness between our regular grades. For example, a wheel slightly harder than grade L and softer than grade M is called grade L+.

SELECTION AND USE OF WHEELS

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A FEW general principles govern the selection of grinding wheels, and every user should become familiar with these, so that he may know what changes to make in order to overcome difficulties and obtain the most efficient results on each operation which he has to do. Customers often express surprise that the wheel manufacturer cannot invariably supply at the first attempt precisely the best wheel for any operation. The reason is this: in every grinding operation the *conditions which determine the best grain and grade, vary more or less.* Among these variable conditions are speed of wheel and work, size and shape of pieces ground, composition and temper of metal, design of machine, condition of machine, rigidity of floor, wet or dry grinding, quality of finish wanted, amount of stock to be removed, etc. Thus it happens that two operators on the same kind of work will often require different wheels. For example, to grind automobile crankshafts we have to supply wheels in every grade from M to Q, although a large majority of grinders find grade N to be the best. Thus experience shows that grade N is the correct grade for the *average conditions* met with in grinding crankshafts, and in the absence of special information we supply grade N for this work. Usually this grade will be found satisfactory, but now and then this is not the case. For instance, the operator may report that the wheel wears too fast. This means that *under the conditions he is using the wheel* a harder grade is needed. Sometimes the trouble may be overcome by altering the conditions, as by increasing the wheel speed or decreasing the work speed, and if the user understands the principles of selection he will know how to go about this.

The more important of these principles may be stated as follows:

1. *If a wheel glazes over, fills, and cuts slowly it is too hard.* Try one or two grades softer.

2. *If a wheel wears too fast, or wears out of round, or quickly loses its shape of face, it is too soft.* Try one or two grades harder. Users often think that because a wheel wears out of round it has "soft spots." This is a mistake. It is a sure indication that a harder grade or higher wheel speed is needed.

3. *Increasing the speed of a wheel will make it act like a wheel of harder grade* and *decreasing the speed will make it appear softer.* On this account a wheel should be speeded up as it wears down, else the surface speed will decrease and the wheel appear softer.

4. *The larger the surface of contact between the wheel and the work, the softer should be the wheel.* Thus a cup wheel or cylinder, used on its side, must be softer than a disc wheel for grinding the same material; and a very thin wheel must be harder than a thick one. In cylindrical grinding work of large diameter will require a softer wheel than work of small diameter. Pieces of work which have only narrow surfaces or edges to be ground need a harder wheel than wide surfaces.

5. In cylindrical grinding, *increasing the work speed tends to wear away the wheel faster. Vibration,* due to worn bearings, too light machines, or shaky floors, *has the same effect.* With any of these conditions a harder wheel must be used.

6. *The use of water permits a slightly harder wheel, and improves the finish.* It prevents overheating the work which otherwise is likely to spring, and become distorted.

7. *In hand grinding the finish depends upon the fineness of the wheel. In cylindrical grinding it depends upon the speed of the work, the speed and condition of the wheel, and to a less extent upon the fineness of the wheel.* A good commercial finish may be had with a wheel as coarse as No. 36, provided it is kept true. Increasing the work speed, with a light cut and slow traverse, will improve the finish.

8. *A wheel is most efficient when it is just soft enough not to glaze and just hard enough not to wear away rapidly.*

9. *To preserve some special shape of face a relatively fine hard wheel should be used.*

We are always glad to offer the benefit of our experience to assist customers to find exactly the right wheel for their work. In cases of unsatisfactory results a full description of the operation should be given and the exact particulars stated in which the wheel has failed to satisfy. It does not help us to overcome the difficulty if customer simply reports that the wheel is unsatisfactory.

On pages 28 and 29 we print a list showing the grain and grade of wheels which have been found most satisfactory for a variety of purposes under average conditions of use. If the wheels there recommended fail in any case to give complete satisfaction, the user, by considering the principles of selection given above, can determine what change is needed to meet his own set of conditions.

TABLE FOR SELECTION OF GRAINS AND GRADES

Class of Work	Corundum Wheels						Carbolite Wheels			
	Vitrified		Silicate		Elastic		Vitrified		Elastic	
	Grain	Grade	Grain	Grade	Grain	Grade	Grain	Grade	Grain	Grade
Aluminum Castings	.....	...	....	....	24–30	4E	20–24	P–R	....	....
" " " Auto surfacing	.....	...	....	....	...	.....	20–30	I–J	....	....
Automobile Cylinders, Internal	.....	...	....	....	...	.....	30–36	I–K	....	....
Bits	46	M	....	....	46	2½–3E	...	...	....	....
Brass Castings, large	.....	...	....	....	...	.....	20–24	R–S	....	....
" " small	.....	...	....	....	...	.....	24–36	Q–R	....	....
Brick, fire	.....	...	....	....	...	.....	16–24	P	....	....
" pressed	.....	...	....	....	...	.....	16–20	O–P	....	....
Bronze Castings, large	.....	...	....	....	...	.....	20–24	R–S	....	....
" " small	.....	...	....	....	...	.....	24–36	Q–R	....	....
Cam Shafts, roughing	24–30	S–T	....	....	...	.....	...	...	....	....
" " finishing	46	L–M	....	....	...	.....	...	...	....	....
Car Wheels, cast iron	.....	...	....	....	...	.....	16–24	P–R	....	....
" " chilled iron	.....	...	....	....	...	.....	16–24	O–Q	....	....
" " steel	16–20	M–N	....	....	...	.....	...	...	....	....
Cast Iron cylindrical	54	L	....	....	...	.....	36–60	L–N	....	....
" " internal	.....	...	....	....	...	.....	36–60	J–L	....	....
" " surfacing	.....	...	....	....	...	.....	14–30	H–L	....	....
" " small castings	.....	...	....	....	...	.....	20–24	R–S	....	....
" " large "	.....	...	....	....	...	.....	16–20	S–T	....	....
Chilled Iron Castings	.....	...	....	....	...	.....	20–24	R–S	....	....
Dies, Steel, surfacing	36	N	....	....	...	.....	...	...	....	....
" Chilled iron	.....	...	....	....	...	.....	20–30	P–Q	....	....
Drop Forgings	16–24	Q–S	....	....	...	.....	...	...	....	....
General Machine Shop use	24–36	O–P	....	....	...	.....	...	...	....	....
Hammers, cast steel	30	P	....	....	...	.....	...	...	....	....
Hollow Ware, inside grinding	.....	...	....	....	...	.....	30	Q	....	....
Int. Grinding, hard steel	46–80	K–M	....	....	...	.....	...	...	....	....
" " soft steel	46–80	L–N	....	....	...	.....	...	...	....	....
Knives, paper, automatic, wet	.....	...	36–46	1½–2	...	.....	...	...	....	....
" planer, automatic, wet	.....	...	30–46	1½–2	...	.....	...	...	....	....
" leather shaving	70–80	M–N	....	....	...	.....	...	...	....	....
" " splitting	.....	...	....	....	30–36	1¼–2E	...	...	....	....
" pocket or pen	.....	...	80–120	3½–4	...	.....	...	...	....	....
" moulding bits, etc	46	M	....	....	46	2½–3E	...	...	....	....
" planing mill, by hand	46–60	M	....	....	46–60	2½–3E	...	...	....	....
" shear and shear blades	.....	...	....	....	30–60	1½–3E	...	...	....	....
" shoe	60	M–N	....	....	...	.....	...	...	....	....
Lathe centers	46–60	J–M	....	....	...	.....	...	...	....	....
Lathe and Planer tools, wet	.....	...	24–30	4	...	.....	...	...	....	....
" " " " dry	46–60	N–P	....	....	...	.....	...	...	....	....
Malleable Iron Castings, large	10–16	Q–S	....	....	...	.....	14–20	R–T	....	....
" " " small	16–24	Q–S	....	....	...	.....	20–30	R–S	....	....
Milling Cutters	46–80	J–M	....	....	...	.....	...	...	....	....
" " carbon steel	.....	...	46–60	1½–2½	...	.....	...	...	....	....
" " high speed steel	46–60	I–K	46–60	1¼–2	46–60	1¼–2E	...	....	....	....
" " surfacing	.....	...	20–36	½–1	...	.....	...	...	....	....
Nickel Castings	.....	...	....	....	...	.....	20–24	Q–R	....	....
Plow Bodies, cast iron, surfacing	.....	...	....	....	...	.....	16–24	R–S	....	....

TABLE FOR SELECTION OF GRAINS AND GRADES (Continued)

Class of Work	Corundum Wheels						Carbolite Wheels			
	Vitrified		Silicate		Elastic		Vitrified		Elastic	
	Grain	Grade	Grain	Grade	Grain	Grade	Grain	Grade	Grain	Grade
Plows, steel-jointing	20–24	Q–S	....	....	...	.....	...	...	....	....
Plow points, chilled, surfacing	.....	...	....	....	...	.....	20–30	R–T	....	....
Plows, steel surfacing	16–24	Q–S	....	....	...	.....	...	...	....	....
Porcelain, roughing	.....	...	....	....	...	.....	36–60	O–P	....	....
" finishing	.....	...	....	....	...	.....	...	...	80–100	3–3½E
Pulleys, C.I. facing, automatic	.....	...	....	....	...	.....	30–46	K–L	....	....
Radiators, cast iron edges	.....	...	....	....	...	.....	20–30	S–T	....	....
Razors	60–100	K–O	....	....	...	.....	...	...	....	....
" concaving	.....	...	60–100	2–3½	...	.....	...	...	....	....
Reamers and Taps	46–60	J–L	....	....	...	.....	...	...	....	....
Rolls, cast iron roughing	.....	...	....	....	...	.....	24–36	L–O	....	....
" " " finishing	.....	...	....	....	...	.....	54–70	L–O	70–90	2½–3E
" chilled iron roughing	.....	...	....	....	...	.....	30–46	L–O	....	....
" " " finishing	.....	...	....	....	...	.....	...	...	70–90	2½–3E
Rubber	46	K	....	....	...	.....	36–60	L–M	....	....
Sad irons, roughing	.....	...	....	....	...	.....	20–30	R–S	....	....
" " finishing bottoms	.....	...	....	....	...	.....	...	...	60–80	2½E
Saws, gumming	50	M–N	....	....	46	2½–3E	...	...	....	....
" cold cutting off	60	O	....	....	46–60	3½–4½E	...	...	....	....
Shovels, edging	20–30	Q–S	....	....	...	.....	...	...	....	....
" surfacing	20–30	P–R	....	....	...	.....	...	...	....	....
Springs, spiral ends of	16–24	Q–S	....	....	...	.....	...	...	....	....
" automobile	16–30	P–R	....	....	...	.....	...	...	....	....
Steel, soft cylindrical	24comb	L–N	....	....	...	.....	...	...	....	....
" surfacing (disc wheel)	20–30	I–K	....	....	...	.....	...	...	....	....
" hard surfacing (disc wheel)	20–46	H–J	....	....	...	.....	...	...	....	....
" hard cylindrical	401	K–L	....	....	...	.....	...	...	....	....
" hard surfacing (cup wheel)	.....	...	24–36	½–1	...	.....	...	...	....	....
" soft surfacing (cup wheel)	.....	...	20–30	¾–1½	...	.....	...	...	....	....
" castings, large	10–16	Q–W	....	....	...	.....	...	...	....	....
" castings, small	20–30	P–R	....	....	...	.....	...	...	....	....
" castings, large, manganese	10–12	R–S	....	....	...	.....	...	...	....	....
" castings, small manganese	16–20	R–S	....	....	...	.....	...	...	....	....
" manganese safe work	16–46	M-Q	....	....	...	.....	...	...	....	....
" manganese frogs, switches	14–16	Q–U	....	....	...	.....	...	...	....	....
" structural	16–24	Q–S	....	....	...	.....	...	...	....	....
Stove castings	.....	...	....	....	...	.....	20–36	R–T	....	....
Twist Drills, hand grinding	46–60	M–N	....	....	...	.....	...	...	....	....
" " special machines	36–60	K–M	....	....	...	.....	...	...	....	....
Wagon Springs, ends of	20–24	Q–S	....	....	...	.....	...	...	....	....
Wire, ends of steel	36–60	R–T	....	....	...	.....	...	...	....	....
Woodworking tools	46–60	L–M	....	....	...	.....	...	...	....	....
Wrought iron	12–30	P–U	....	....	...	.....	...	...	....	....

SUGGESTIONS FOR ORDERING

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TO secure satisfactory wheels particular attention should be paid to the information necessary for us to fill your order intelligently. State clearly on your orders the quantity required, the diameter of the wheels, thickness of wheels, size of arbor holes, description of material to be ground, and the speed at which it is proposed to run the wheels. This information is all that is necessary in ordering wheels for floor or bench grinders where the pieces to be ground are fed to the wheel strictly by hand. In ordering wheels for such machines it would be well to advise us if you intend to grind edges or surfaces, whether you care more for rapid work than high finish, etc. Also advise us if the grinding is to be done wet or dry. If you have a piece of a satisfactory wheel on hand it would be well to mail us a small sample for comparative purposes.

In ordering wheels for cylindrical and surface grinding it is necessary to give more complete information, such as is specified on our information sheet shown on the opposite page.

In ordering safety shape wheels is is necessary to give the diameter of flat spot, if any, and the taper per foot; also state if the taper is wanted on one on both sides.

In general, if the grain and grade of hardness is known it is not necessary to give us further information. In the case of repeat orders it is only necessary to refer to your last order, giving the order number or date of order, as a complete record of all wheels shipped is kept on file in our office. To eliminate chances of error it is well to keep the tags which are attached to the side of wheels and return this tag to us when similar wheels are wanted. If there is any doubt whatever regarding the grain and grade of hardness, it is always safer to fully describe the kind of work you wish to do, and leave the selection of the proper wheels to us.

American Emery Wheel Works

This refers to Customer's Order_____

INFORMATION SHEET

To give complete satisfaction grinding wheels must be selected to fit individual conditions of use. Unless we know just what customer's conditions are, it is difficult or impossible to select the most efficient wheels. Please, therefore, fill in blank spaces below and cross out all words which do not apply. This will help us to send the right wheels for the work.
If you want wheels the same as previously supplied do not use this sheet,—simply refer to the last lot.

Firm_____ **Date**_____

Address_____ **Deliver by** Freight, Express, Parcel Post

TO BE FILLED IN BY CUSTOMER OR SALESMAN						TO BE FILLED IN BY A. E. W. W.		
QUANTITY	DIAM.	THICK.	HOLE	FACE	REMARKS	GRAIN	GRADE	ABRASIVE

DESCRIPTION OF MACHINE

Make_____ Condition_____
Wheel Speed_____ R. P. M._____ Constant or Variable?_____
Work Speed_____ R. P. M._____ Constant or Variable?_____
Automatic Grinding—Cylindrical, Surface, or Internal_____
Freehand Grinding—With Rest or Without Rest_____
Snagging with Swing Frame or Portable Grinder_____
Wet or Dry_____

DESCRIPTION OF WORK

Name of Part_____
Material_____ Hard, Soft, Chilled, Annealed_____
Size or Weight_____
Amount of Stock to be removed_____
Kind of Finish desired_____
Wheel last used_____ Grain_____ Grade_____
Was it too Fine, too Coarse, too Soft, too Hard, just Right?_____

REMARKS_____

THIS SPACE MAY BE USED FOR SKETCHES, OR DESCRIPTION OF SPECIAL CONDITIONS

NOTICE

Please use separate sheet for each different operation.
Attach this form to your order and mail to

AMERICAN EMERY WHEEL WORKS
PROVIDENCE : RHODE ISLAND

GENERAL SUGGESTIONS

Do not judge the value of a grinding wheel by the number of hours it lasts or the number of pieces ground during its life. A wheel considerably too hard for a job should not be used. It would have to be dressed often. It would have long life, but every time you dress a wheel a valuable machine is a non-producer while the operator's time and overhead expense is going on. In comparing wheel costs, figure out the cost per piece ground taking into consideration machine operation, including labor and overhead as well as the price of wheel itself.

We emphasize the economy of soft, free-cutting wheels, that is, wheels soft enough to wear away in use, so as to keep themselves sharp. The mistake is often made of using too hard a wheel with the result that the grains of abrasive remain in the wheel face long after they become dull, leading to glazing of the wheel, reduced output of work and trouble with burning and checking of the work surface.

Do not expect one wheel to answer equally well for all kinds of work. A variety of wheels of different grades and numbers should be kept on hand, each wheel being selected for a particular purpose.

Never crowd a wheel as it will not cut any faster, but will simply heat the work and wear out the wheel sooner.

From an economical standpoint, it is sometimes advisable to use the largest size wheel possible. A careful study of the standard grinding wheel list prices shows that in most instances the cost of grinding wheels per cubic inch decreases as the size increases. For instance, there is a big saving to be had by changing from the use of 12″ x 2″ grinding wheels to wheels 24″ x 4″, providing, of course, that the work to be done is of a nature that permits this change. Our cost department is always glad to compute for our customers the comparative costs per cubic inch of any grinding wheels, taking into consideration the size of flange and the wheel waste on that account.

The bursting strain to which a wheel is subject varies directly as the square of its velocity of rotation. An increase of 41%, for instance, above the working speed recommended by the manufacturer is sufficient to impose approximately twice the bursting strain upon the wheel. This would greatly reduce the factor of safety provided by the rigorous test which each wheel undergoes before leaving the factory.

American Emery Wheel Works

GENERAL SUGGESTIONS (Continued)

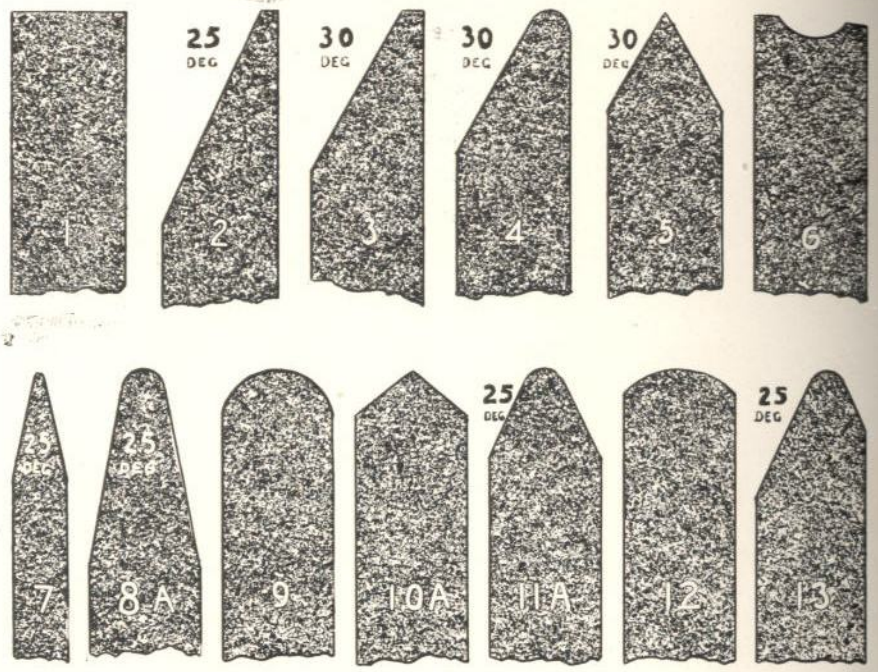
It is a good idea to keep the tags which are sent on the wheels in a record book, so that if the wheel does not prove satisfactory, reference can be made to the order number when making complaint. These tags are especially good reference when ordering duplicate wheels, as they give us all information necessary for positive duplication.

A grinding wheel that bumps or thumps does not cut on its entire periphery, and is not doing its best work, nor is such a wheel safe to use.

Keep your wheels perfectly true and in balance. For rapid and accurate work, a dresser should be kept constantly on hand to dress up the wheels a little each day, and not allow them to get at all out of true.

When truing and dressing grinding wheels the diamond should be firmly held in the holder and the holder firmly attached to the table of the grinding machine. The diamond should be traversed rapidly by the face of the grinding wheel until the wheel is absolutely true. This rapid traverse will leave the face of the wheel rough and in proper condition for rough grinding. To secure a good finish the final pass of the diamond across the wheel face should be very slow. To obtain an extra fine finish the face of the grinding wheel should be slightly glazed by holding a piece of an oil stone against it for a moment.

Our engineering department welcomes requests from managers, foremen or operators for information as to the correct wheel for any grinding operation or any other grinding wheel problem they may have. Our experience and facilities for conducting experiments will be of value in many cases.



SHAPES OF WHEEL FACES

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SPECIAL shapes of cutting edges are frequently required, and will be gladly furnished upon receipt of diagram showing what is wanted.

Above are shown those most commonly used for grinding moulding cutters, and for saw gumming. These should be ordered by the numbers given upon the diagrams. Any desired shape will be furnished.

We furnish wheels with square faces when no shape is specified.

We will gladly furnish on request, the Safety Code for the Use and Care of Grinding Wheels, also the booklet covering the Standardization of Grinding Wheel Shapes, both of which have been adopted by the Abrasive Wheel Manufacturers of the United States and Canada.

WEIGHTS OF WHEELS

It is frequently desirable, especially for our foreign customers, to know the weights of wheels. The table bowels hows the approximate net weights, in pounds, of our wheels.

Diam.	THICKNESS										
	1-4"	3-8"	1-2"	3-4"	1"	1 1-2"	2"	2 1-2"	3"	4"	
1 "	.017	.026	.034	.051	.068	.....	.....	.....	.....	.....	
1½"	.038	.058	.076	.12	.16	.24	.32	.....	.....	.....	
2 "	.068	.11	.14	.21	.28	.42	.56	.....	.....	.....	
2½"	.11	.16	.22	.33	.44	.65	.88	1.10	1.92	.....	
3 "	.16	.24	.32	.48	.64	.96	1.28	1.60	3.00	4.00	
4 "	.25	.38	.50	.75	1.00	1.50	2.00	2.50	4.80	6.40	
5 "	.40	.60	.80	1.20	1.60	2.40	3.20	4.00	6.70	9.00	
6 "	.55	.85	1.10	1.70	2.25	3.35	4.50	5.60	9.60	12.8	
7 "	.80	1.20	1.60	2.40	3.20	4.80	6.40	8.00	12.6	16.8	
8 "	1.05	1.57	2.10	3.15	4.20	6.30	8.40	10.5	15.9	21.2	
9 "	1.33	2.00	2.65	4.00	5.30	8.00	10.6	13.4	19.5	26.0	
10 "	1.62	2.43	3.25	4.86	6.50	9.70	13.0	16.3	28.2	37.6	
12 "	2.35	3.50	4.70	7.00	9.40	14.0	18.8	23.5	37.4	51.2	
14 "	3.20	4.80	6.40	9.60	12.8	19.2	25.6	32.0	50.1	66.8	
16 "	.....	6.25	8.35	12.5	16.7	25.0	33.4	41.7	63.6	84.8	
18 "	.....	.....	10.6	16.0	21.2	32.0	42.4	53.0	78.6	105.	
20 "	.....	.....	.....	19.5	26.2	39.0	52.4	65.5	95.1	127.	
22 "	.....	.....	.....	.....	31.7	47.5	63.4	79.2	113.	151.	
24 "	.....	.....	.....	.....	37.7	56.5	75.4	94.2	133.	177.	
26 "	.....	.....	.....	.....	.....	66.3	88.4	110.	177.	236.	
30 "	.....	.....	.....	.....	.....	88.5	118.	147.	254.	339.	
36 "	.....	.....	.....	.....	.....	127.	169.	212.	345.	460.	
42 "	.....	.....	.....	.....	.....	.....	230.	288.	453.	604.	
48 "	.....	.....	.....	.....	.....	.....	302.	378.	573.	764.	
54 "	.....	.....	.....	.....	.....	.....	.....	478.	708.	944.	
60 "	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	

The above weights are of wheels made by the vitrified process, the process used in making more than 90% of our wheels. To obtain weights of wheels made by the silicate or elastic process, add 20% to the figures shown.

RULES FOR FIGURING LIST PRICES OF STRAIGHT WHEELS

THICKNESS

All fractional parts of inches not shown, take the next higher list.

EXAMPLE.—A wheel 2⅝″ thickness takes the list of 2¾″. Any wheel thinner than ¼″ takes the list of ¼″. Wheels thicker than 4″ are figured proportionately to the 4″ thickness for any given diameter, the list to use being the next higher quarter inch.

EXAMPLE.—30″ x 7⅜″ thick wheel. A 30″ diameter x 4″ thick wheel lists at $174.00. Divide by 4 and multiply by 7½ equals $326.25.

DIAMETER

All fractional parts of inches, and odd inches not shown, take the next higher list.

EXAMPLE.—A wheel 5½″ in diameter takes the list of a 6″, and a wheel 12½″ or 13″ in diameter takes the list of a 14″. Any wheel less than 1″ in diameter takes the list of a 1″.

HOLE

An allowance of ⅓ the list value of wheel represented by a hole of 12″ in diameter or over, is made. No allowance for holes less than 12″ in diameter, or for countersinks of whatever size.

EXAMPLE.—24″ x 2″ thick x 14″ hole. A 24″ x 2″ wheel lists at $59.00, a 14″ x 2″ wheel lists at $21.20, ⅓ of $21.20 is $7.05 which amount is deducted from $59.00, leaving a list for the 24″ x 2″ x 14″ wheel, of $51.95.

If diameter of hole is in odd inches or fractional parts of inches such as are not listed, or the thickness of wheel represented by the hole is in fractional parts of inches not shown, next smaller list is taken as representing the wheel for which allowance is made.

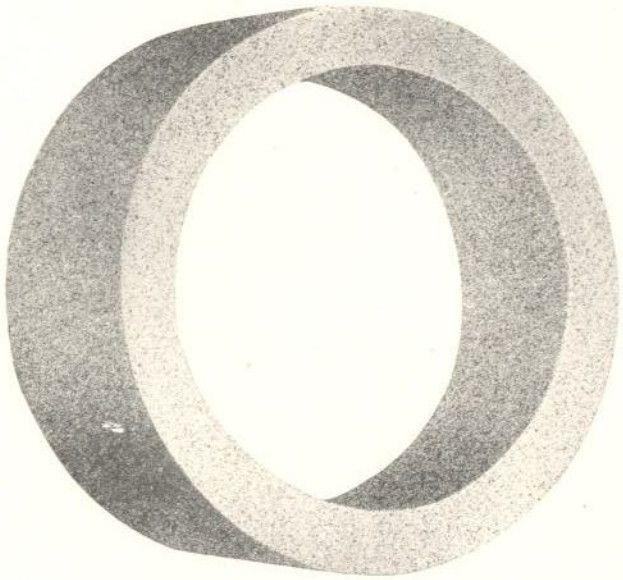
EXAMPLE.—24″ x 2⅛″ thick x 15¾″ hole. A 24″ x 2⅛″ wheel lists at $65.00, an allowance is made for ⅓ of a 14″ x 2″ wheel, which lists at $21.20, ⅓ of which is $7.05, which amount is deducted from $65.00, leaving a list for the 24″ x 2⅛″ x 15¾″ wheel, of $57.95.

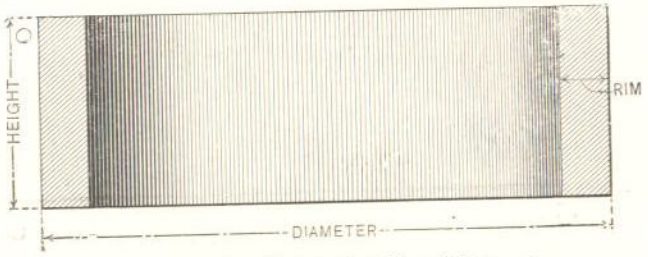
PRICE LIST—STRAIGHT WHEELS

Subject to Discount

Diameter In.	Diameter mm.	Thickness of Wheels in Inches and Millimeters: In.—4 mm.—6	½ 12	⅝ 19	1 25	1¼ 32	1½ 38	1¾ 45	2 50	2½ 56	2½ 63	2¾ 70	3 75	3½ 82	3¾ 88	3¾ 95	4 100	Diameter mm.	Diameter In.
1	25	$0.40	$0.50	$0.60	$0.70	$0.80	$0.95	$1.05	$1.15	$1.25	$1.35	$1.45	$1.55	$1.70	$1.80	$1.90	$2.00	25	1
2	50	.60	.75	.90	1.00	1.15	1.30	1.45	1.60	1.75	1.85	2.00	2.15	2.30	2.40	2.55	2.70	50	2
3	75	.80	1.00	1.20	1.45	1.65	1.85	2.10	2.30	2.50	2.70	2.95	3.15	3.35	3.55	3.80	4.00	75	3
4	100	1.10	1.40	1.65	1.95	2.25	2.55	2.80	3.10	3.40	3.70	4.00	4.25	4.55	4.80	5.10	5.40	100	4
5	125	1.50	1.90	2.25	2.65	3.00	3.40	3.80	4.15	4.55	4.90	5.30	5.70	6.05	6.40	6.80	7.20	125	5
6	150	1.90	2.40	2.90	3.40	3.90	4.45	4.95	5.40	5.95	6.50	7.00	7.50	8.00	8.50	9.00	9.50	150	6
7	175	2.30	2.95	3.60	4.30	4.95	5.60	6.30	6.90	7.55	8.20	8.90	9.60	10.25	10.90	11.55	12.20	175	7
8	220	2.70	3.55	4.40	5.20	6.10	6.90	7.80	8.60	9.45	10.30	11.15	12.00	12.85	13.70	14.55	15.40	220	8
9	230	3.10	4.15	5.20	6.30	7.40	8.40	9.50	10.60	11.65	12.70	13.75	14.80	15.90	17.00	18.05	19.10	230	9
10	250	3.60	4.90	6.20	7.50	8.90	10.20	11.50	12.80	14.10	15.40	16.70	18.00	19.35	20.70	22.00	23.30	250	10
12	305	4.20	6.00	7.80	9.50	11.30	13.10	14.90	16.70	18.45	20.20	22.00	23.80	25.55	27.30	29.10	30.90	305	12
14	355	4.90	7.20	9.60	11.90	14.20	16.50	18.90	21.20	23.50	25.80	28.15	30.50	32.80	35.10	37.45	39.80	355	14
16	405	5.70	8.70	11.60	14.60	17.60	20.50	23.50	26.50	29.45	32.40	35.35	38.30	41.30	44.30	47.25	50.20	405	16
18	460	6.60	10.30	14.00	17.70	21.40	25.10	28.80	32.50	36.15	39.80	43.50	47.20	50.90	54.60	58.30	62.00	460	18
20	510	....	12.30	16.80	21.40	25.90	30.50	35.00	39.60	44.15	48.70	53.35	58.00	62.50	67.00	71.50	76.00	510	20
22	560	....	....	20.10	25.60	31.10	36.70	42.20	47.70	53.35	59.00	64.50	70.00	75.50	81.00	86.50	92.00	560	22
24	610	....	....	24.00	30.60	37.30	44.00	51.00	59.00	65.00	71.00	78.00	85.00	92.00	99.00	106.00	113.00	610	24
26	660	....	....	....	36.40	44.50	52.50	61.00	69.00	77.00	85.00	93.00	101.00	109.00	117.00	125.00	133.00	660	26
28	710	....	....	....	....	46.00	55.00	65.00	74.00	83.00	92.00	102.00	111.00	120.00	129.00	139.00	148.00	710	28
30	760	....	....	....	....	58.00	68.00	79.00	89.00	100.00	111.00	122.00	132.00	143.00	153.00	164.00	174.00	760	30
32	810	....	....	....	....	....	72.00	84.00	96.00	109.00	121.00	133.00	145.00	157.00	169.00	181.00	193.00	810	32
34	865	....	....	....	....	....	82.00	95.00	109.00	123.00	136.00	150.00	163.00	177.00	191.00	204.00	218.00	865	34
36	915	....	....	....	....	....	94.00	109.00	124.00	139.00	154.00	169.00	183.00	198.00	213.00	228.00	243.00	915	36
38	965	....	....	....	....	....	....	....	136.00	153.00	170.00	187.00	204.00	221.00	238.00	255.00	272.00	965	38
40	1015	....	....	....	....	....	....	....	....	170.00	189.00	207.00	226.00	245.00	264.00	283.00	302.00	1015	40
42	1070	....	....	....	....	....	....	....	....	....	209.00	229.00	249.00	270.00	290.00	311.00	331.00	1070	42
44	1120	....	....	....	....	....	....	....	....	....	228.00	251.00	274.00	297.00	319.00	342.00	365.00	1120	44
46	1170	....	....	....	....	....	....	....	....	....	249.00	274.00	299.00	324.00	349.00	374.00	399.00	1170	46
48	1220	....	....	....	....	....	....	....	....	271.00	299.00	326.00	353.00	380.00	407.00	434.00	1220	48	
50	1270	....	....	....	....	....	....	....	....	....	....	....	353.00	383.00	412.00	442.00	471.00	1270	50
52	1320	....	....	....	....	....	....	....	....	....	....	....	382.00	414.00	446.00	478.00	510.00	1320	52
54	1370	....	....	....	....	....	....	....	....	....	....	....	412.00	447.00	481.00	515.00	550.00	1370	54
56	1425	....	....	....	....	....	....	....	....	....	....	....	443.00	480.00	517.00	554.00	591.00	1425	56
58	1475	....	....	....	....	....	....	....	....	....	....	....	476.00	515.00	555.00	594.00	634.00	1475	58
60	1525	....	....	....	....	....	....	....	....	....	....	....	509.00	551.00	594.00	636.00	679.00	1525	60

CYLINDERS





Rules for Calculating List Prices

A wheel 8″ or more outside diameter, 4″ or more in height, with a hole not less than 6″ in diameter rim thickness not exceeding 4″ and without inside projections, is figured as a cylinder.

A wheel of this type with inside projections is a cup wheel.

A cylinder with outside projections or with tapered rims takes the list price of the maximum diameter and the maximum thickness of rim.

EXAMPLE: A taper cylinder 12″/10″ diameter, 6″ in height, with a rim taper 1″ at top to 1½″ at bottom, takes a list of 12 x 6 x 1½″ wheel, $32.10.

EXAMPLE: A cylinder 16″ in diameter at top, 5″ high, with a rim 2″ thick at the top, and with an outside projection at the bottom of one-half an inch, lists as an 18 x 5 x 2½″ rim, or $59.70.

Cylinder wheels with diameters intermediate to those shown on list take the list of the next larger diameter.

Cylinders with heights intermediate to those shown in list take the list of the next higher cylinder.

Cylinder wheels with rim thicknesses intermediate to those shown in list take the list of the next thicker rim.

Cylinders more than 8″ in height are figured proportionately to the 8″ height for anyl isted diameter. Heights of cylinders increase by 1″ from 8″, and intermediate heights take the price of the next higher inch.

EXAMPLE: A cylinder 26″ in diameter, 8″ in height, with 2″ rim, lists as $166.95. A cylinder of the same diameter with rim height 9″ would take an additional list of one-eighth of $166.95, or $20.85, making the total list for cylinder 26 x 9 x 2″ rim, $187.80.

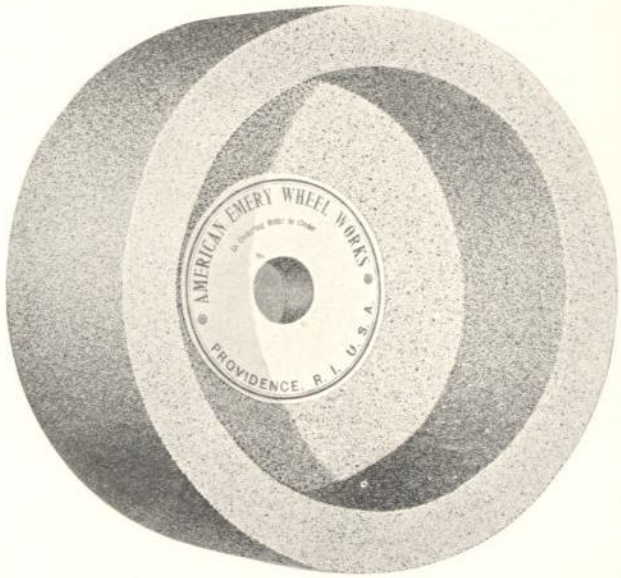
PRICE LIST—CYLINDERS

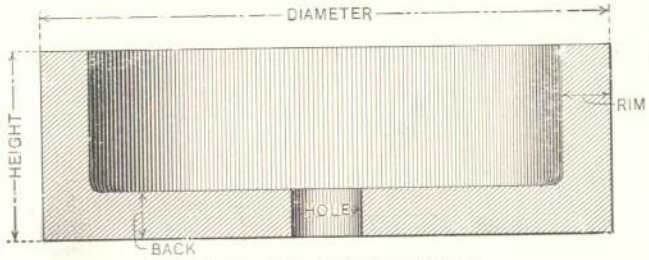
SUBJECT TO DISCOUNT

Diam. in Inches	Height in Inches	THICKNESS OF RIM IN INCHES 1	1½	2	2½	3	3½	4
8″	4	$13 75	$17 20	$21 10	$26 20	$27 10	$34 60	$35 55
	5	17 35	20 95	25 20	31 05	32 20	41 85	43 05
	6	19 75	23 85	28 50	35 80	37 15	48 45	49 90
	7	22 30	27 15	33 00	41 05	42 70	56 25	58 00
	8	25 50	31 00	37 70	46 90	48 80	64 30	66 30
9″	4	16 30	$17 20	.....	.....	.....	.....	.....
	5	19 80	20 95	.....	.....	.....	.....	.....
	6	22 45	23 85	.....	.....	.....	.....	.....
	7	25 60	27 15	.....	.....	.....	.....	.....
	8	29 25	31 00	.....	.....	.....	.....	.....
10″	4	18 90	20 05	$21 10	.....	.....	.....	.....
	5	22 50	23 95	25 20	.....	.....	.....	.....
	6	25 60	27 30	28 50	.....	.....	.....	.....
	7	29 35	31 20	33 00	.....	.....	.....	.....
	8	33 55	35 65	37 70	.....	.....	.....	.....
12″	4	22 20	23 70	25 00	$26 20	$27 10	.....	.....
	5	26 20	28 00	29 65	31 05	32 20	.....	.....
	6	30 00	32 10	34 05	35 80	37 15	.....	.....
	7	31 35	36 85	38 85	41 05	42 70	.....	.....
	8	39 25	42 10	44 40	46 90	48 80	.....	.....
14″	4	27 30	29 05	30 70	32 20	33 45	$34 60	$35 55
	5	32 85	35 05	37 05	38 85	40 50	41 85	43 05
	6	37 75	40 35	42 75	44 85	46 90	48 45	49 90
	7	43 80	46 80	49 65	52 15	54 30	56 25	58 00
	8	50 05	53 50	56 75	59 60	62 05	64 30	66 30
16″	4	34 20	36 30	38 25	40 05	41 25	43 15	44 40
	5	41 10	43 80	46 20	48 45	49 95	52 20	53 85
	6	48 55	51 60	54 45	57 15	58 90	61 65	63 60
	7	55 35	58 90	62 20	65 40	67 35	70 60	72 85
	8	63 25	67 30	71 10	74 75	76 95	80 70	83 25
18″	4	42 70	45 00	47 25	49 35	51 30	52 80	54 70
	5	51 40	54 30	57 10	59 70	62 10	64 00	66 25
	6	59 10	62 35	65 95	69 00	71 85	74 20	76 90
	7	67 75	71 85	75 70	79 30	82 50	85 35	88 35
	8	77 40	82 10	86 50	90 60	94 30	97 55	100 95

Diam. in Inches	Height in Inches	THICKNESS OF RIM IN INCHES 1	1½	2	2½	3	3½	4
20″	4	$51 15	$53 85	$56 10	$58 80	$61 20	$63 15	$65 20
	5	61 20	64 60	67 50	70 75	73 75	76 05	78 60
	6	70 60	74 55	78 10	81 90	85 45	88 30	91 30
	7	80 95	85 50	89 65	94 00	98 10	101 40	104 85
	8	92 50	97 70	102 45	107 40	112 10	115 90	119 80
22″	4	62 80	65 80	68 70	71 50	74 05	76 45	78 70
	5	75 60	79 35	82 90	86 35	89 50	92 50	95 25
	6	87 15	91 60	95 85	100 00	103 75	107 25	110 55
	7	100 05	105 25	110 10	114 90	119 25	123 40	127 20
	8	114 35	120 30	125 80	131 30	136 30	141 00	145 40
24″	4	70 30	73 65	76 90	79 95	82 90	85 60	88 20
	5	86 55	90 70	94 75	98 40	102 10	105 45	108 60
	6	100 45	105 40	110 20	114 60	118 95	122 95	126 75
	7	115 05	120 75	126 45	131 50	136 50	141 15	145 50
	8	131 50	138 00	144 50	150 30	156 00	161 30	166 30
26″	4	81 40	85 20	88 65	92 05	95 25	98 25	101 20
	5	99 90	104 50	108 85	113 05	116 95	120 70	124 30
	6	116 35	121 80	127 00	132 00	136 95	141 15	145 35
	7	133 75	140 10	146 10	151 95	157 35	162 55	167 40
	8	152 85	160 10	166 95	173 65	179 80	185 75	191 30
28″	4	90 70	94 75	98 55	102 40	105 85	109 35	112 75
	5	111 85	116 95	121 60	126 30	130 65	135 10	139 15
	6	129 85	136 00	141 55	147 10	152 35	157 60	162 45
	7	150 55	157 75	164 20	170 55	176 70	182 85	188 40
	8	172 05	180 30	187 65	194 90	201 95	208 95	215 30
30″	4	104 20	108 45	112 65	116 80	120 60	124 05	127 90
	5	128 50	133 80	139 05	144 00	148 65	153 10	157 75
	6	148 90	155 20	161 50	167 35	172 90	178 15	183 75
	7	172 00	179 25	186 60	193 30	199 75	205 90	212 35
	8	196 55	204 85	213 25	220 90	228 30	235 30	242 70

CUP WHEELS





Rules for Calculating List Prices

The cup wheel price list is based on cups with the same back and rim thickness.

A wheel 8″ or more outside diameter, 4″ or more in height, with an inside cup diameter of not less than 6″, and a rim thickness not exceeding 4″ is figured as a cup wheel. Cups with outside projections, or tapered rims, take the list of the maximum diameter and maximum thickness of rim.

EXAMPLE: A cup 24″ diameter at top, 7″ high, with a rim 3″ thick at the top and having an outside projection of ⅜″ at the bottom, lists as a 26 x 7 x 3½″ cup wheel at $186.60.

EXAMPLE: A taper cup 14/12½″ diameter, 7″ in height, with rim tapering 1½″ at top to 2½″ at the bottom, takes list of a cup 14″x 7″x 2½″ rim and back, $58.05.

Cup wheels with diameters intermediate to those shown in list take the list of the next larger diameter.

Cup wheels with heights intermediate to those shown in list take the list of the next higher cup.

For cup wheels more than 8″ in height, with thickness of the back varying from that of rim, calculate first the list for height and then make proper additions or deductions for back.

EXAMPLE: A cup 14″ diameter, 9″ high, 2″ rim, 3″ back. The list price of the cup 8″ high and 2″ back is $63.60. Add one-eighth or $7.95, which amounts to $71.55, plus $1.85 for the extra thickness of back, which makes the price $73.40.

If the back were 1″ thick, $1.85 would be deducted from $71.55.

If the back were between 1″ and 2″ thickness, no allowance would be made.

The back of a cup wheel is represented by any projection inside the cup, whether it is in the form of a small shoulder, raised dove-tail or complete back.

For backs less than 1″ deductions from list down to 1″ only are allowed, and made only in full inches.

No allowance is made for holes in backs of cup wheels, regardless of diameter.

PRICE LIST—CUP WHEELS

SUBJECT TO DISCOUNT

Diam. in Inches	Height in Inches	THICKNESS OF RIM AND BACK IN INCHES: 1	1½	2	2½	3	3½	4
8″	4	$16 20	.....	.....	.....	.....	.....	.....
	5	18 90	.....	.....	.....	.....	.....	.....
	6	21 45	.....	.....	.....	.....	.....	.....
	7	23 85	.....	.....	.....	.....	.....	.....
	8	27 25	.....	.....	.....	.....	.....	.....
Back per inch		**65**	.....	.....	.....	.....	.....	.....
9″	4	18 25	.....	.....	.....	.....	.....	.....
	5	21 55	.....	.....	.....	.....	.....	.....
	6	24 15	.....	.....	.....	.....	.....	.....
	7	27 15	.....	.....	.....	.....	.....	.....
	8	31 00	.....	.....	.....	.....	.....	.....
Back per inch		**90**	.....	.....	.....	.....	.....	.....
10″	4	21 00	22 20	$23 20	.....	.....	.....	.....
	5	24 70	26 20	27 40	.....	.....	.....	.....
	6	27 75	29 55	30 70	.....	.....	.....	.....
	7	31 45	33 45	35 20	.....	.....	.....	.....
	8	35 95	38 25	40 25	.....	.....	.....	.....
Back per inch		**1 20**	**90**	**65**	.....	.....	.....	.....
12″	4	25 50	27 30	28 65	$29 70	$30 25	.....	.....
	5	29 50	31 60	33 30	34 60	35 35	.....	.....
	6	33 45	35 85	37 90	39 45	40 45	.....	.....
	7	38 05	40 80	42 90	44 95	46 20	.....	.....
	8	43 50	46 65	49 00	51 35	52 80	.....	.....
Back per inch		**1 85**	**1 50**	**1 20**	**90**	**65**	.....	.....
14″	4	31 80	34 20	36 10	37 50	38 55	$39 25	$39 60
	5	37 45	40 20	42 45	44 20	45 60	46 50	47 10
	6	42 60	45 90	48 55	50 55	52 35	53 50	54 30
	7	49 00	52 60	55 65	58 05	60 00	61 50	62 65
	8	56 00	60 10	63 60	66 35	68 55	70 30	71 60
Back per inch		**2 70**	**2 25**	**1 85**	**1 50**	**1 20**	**90**	**65**
16″	4	39 75	42 85	45 30	47 25	48 30	49 80	50 50
	5	47 55	51 25	54 15	56 55	57 90	59 80	60 85
	6	55 00	59 05	62 40	65 25	66 85	69 25	70 60
	7	62 35	66 85	70 65	74 05	75 85	78 70	80 35
	8	71 25	76 40	80 75	84 60	86 70	89 95	91 80
Back per inch		**3 65**	**3 15**	**2 70**	**2 25**	**1 85**	**1 50**	**1 20**
18″	4	51 40	55 15	58 30	60 85	62 80	64 05	65 40
	5	60 25	64 60	68 25	71 35	73 75	75 40	77 10
	6	68 85	73 50	78 00	81 55	84 40	86 50	88 65
	7	77 70	83 20	87 90	91 95	95 20	97 80	100 30
	8	88 80	95 10	100 45	105 10	108 80	111 75	114 60
Back per inch		**4 75**	**4 20**	**3 65**	**3 15**	**2 70**	**2 25**	**1 85**

Diam. in Inches	Height in Inches	THICKNESS OF RIM AND BACK IN INCHES: 1	1½	2	2½	3	3½	4
20″	4	$61 60	$66 40	$69 75	$73 30	$76 05	$77 95	$79 50
	5	71 65	77 05	81 10	85 15	88 55	90 75	92 85
	6	81 70	87 70	92 35	97 00	100 90	103 65	106 20
	7	92 25	98 95	104 20	109 35	113 85	117 10	120 10
	8	105 40	113 10	119 10	124 95	130 10	133 85	137 25
Back per inch		**6 05**	**5 40**	**4 75**	**4 20**	**3 65**	**3 15**	**2 70**
22″	4	74 25	79 65	84 40	88 45	91 65	94 30	96 30
	5	86 80	92 95	98 25	103 00	106 80	110 05	112 60
	6	98 85	105 75	111 85	117 25	121 65	125 40	128 50
	7	112 35	119 95	126 60	132 70	137 70	142 05	145 65
	8	128 40	137 10	144 70	151 65	157 35	162 35	166 45
Back per inch		**7 45**	**6 75**	**6 05**	**5 40**	**4 75**	**4 20**	**3 65**
24″	4	84 10	90 55	96 15	100 95	105 00	108 30	111 00
	5	99 40	106 65	113 10	118 50	123 30	127 30	130 50
	6	113 65	121 65	128 85	135 00	140 50	145 05	148 95
	7	128 85	137 65	145 75	152 50	158 65	163 90	168 30
	8	147 25	157 30	166 55	174 30	181 30	187 30	192 35
Back per inch		**9 05**	**8 25**	**7 45**	**6 75**	**6 05**	**5 40**	**4 75**
26″	4	95 40	103 00	109 60	115 30	120 10	124 15	127 50
	5	112 30	120 70	128 10	134 65	140 10	144 90	148 95
	6	128 55	137 85	146 10	153 45	159 75	165 25	169 90
	7	145 95	156 15	165 25	173 40	180 40	186 60	191 95
	8	166 80	178 45	188 85	198 15	206 15	213 25	219 35
Back per inch		**10 75**	**9 85**	**9 05**	**8 25**	**7 45**	**6 75**	**6 05**
28″	4	110 70	120 00	128 20	134 85	141 00	146 40	150 70
	5	131 20	141 55	150 55	158 10	165 15	171 45	176 40
	6	149 10	160 50	170 40	178 80	186 75	193 90	199 65
	7	169 50	181 95	192 75	202 00	210 85	218 85	225 30
	8	193 70	207 95	220 30	230 85	240 95	250 10	257 50
Back per inch		**12 45**	**11 80**	**10 95**	**9 90**	**9 15**	**8 35**	**7 50**
30″	4	126 00	136 15	145 00	153 60	160 90	166 30	172 95
	5	150 15	161 35	171 25	180 70	188 80	195 15	201 75
	6	170 50	182 65	193 60	203 95	212 95	220 15	227 70
	7	193 35	206 50	218 50	229 65	239 55	247 65	256 05
	8	220 95	236 00	249 70	262 45	273 75	283 00	292 60
Back per inch		**14 55**	**13 60**	**12 45**	**11 80**	**10 95**	**9 90**	**9 15**
		.....	.....	.....	.....	.....	.....	.....
		.....	.....	.....	.....	.....	.....	.....
		.....	.....	.....	.....	.....	.....	.....
		.....	.....	.....	.....	.....	.....	.....
		.....	.....	.....	.....	.....	.....	.....

TAPER WHEELS

○ ○ ○

TAPER wheels (sometimes called "bevelled side" or "safety shape" wheels) are wheels having one or both sides bevelled, making the wheels thicker at the hub than at the face or periphery of the wheel.

To figure the list price of taper wheels, take the base price of a straight wheel of the same diameter and *thickness at the face,* and add the proper taper wheel list price shown below, corresponding to the taper supplied.

EXAMPLE: A wheel 24″ x 2″ lists at $59. If this wheel is to be tapered ½″ to the foot, the list will be $59 plus $10, or $69. If the wheel is to be tapered ¾″ to the foot the list will be $59 plus $15, or $74. The same additions would be made for any thickness of 24″ wheel, whether to be 1″ at the face, 3″, 4″, 5″, or more

For wheels with taper only on one side, either ½″ or ¾″ to the foot, add but one-half of the additions given.

EXAMPLE: A wheel 24″ x 2″ lists at $59. If this wheel is to be tapered one side only, ½″ to the foot, the list price will be $59 plus $5, or $64.

If the wheel is to be tapered one side only, ¾″ to the foot, the list will be $59 plus $7.50, or $66.50.

List Additions to Straight Wheel List Prices for Taper-Side Grinding Wheels Any Thickness

Diameter	½″Taper Add to List–Any Thickness	¾″Taper Add to List–Any Thickness
10″	$1.00	$1.50
12″	1.50	2.00
14″	2.00	3.00
16″	2.50	4.50
18″	3.50	6.00
20″	5.00	8.00
22″	7.00	11.00
24″	10.00	15.00
26″	13.00	20.00
28″	16.00	25.00
30″	19.00	31.00
32″	23.00	39.00
34″	27.00	48.00
36″	$33.00	$57.00
38″	39.00	68.00
40″	46.00	80.00
42″	54.00	92.00
44″	65.00	108.00
46″	75.00	125.00
48″	85.00	142.00
50″	96.00	162.00
52″	108.00	184.00
54″	121.00	207.00
56″	136.00	231.00
58″	152.00	257.00
60″	170.00	287.00

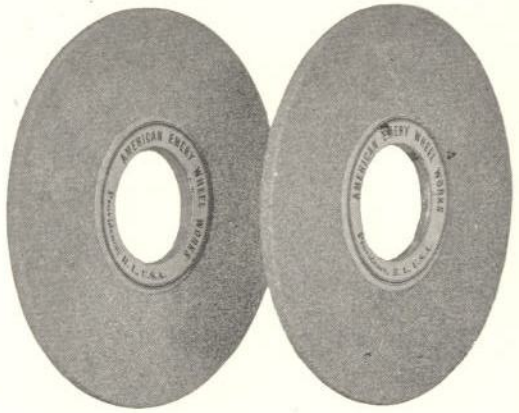
SPECIAL WHEELS

¶ The following 58 pages are devoted to shapes and sizes of grinding wheels for special machines. ¶ We can furnish any other special shape wheels required for any grinding operation, provided sketch and information, as suggested on page 28, are given us.

Wheels for BROWN & SHARPE Grinding Machines

STRAIGHT WHEELS

B. & S.



SHAPE No. 1

SHAPE NO.	CODE WORD	DIAMETER	THICKNESS	HOLE	LIST PRICE
1	BRABBLE	7″	1/4″	2″	$2.30
2	BRACELET	7″	3/8″	3/4″	2.95
3	BRACER	12″	1/2″	.5″	6.00
5	BRACT	7	1/2″	3/4″	2.95
8	BRAGGART	9″	5/8″	5″	5.20
9	BRAHMA	6″	1/4″	3/4″	1.90
10	BRAIN	8″	3/8″	2″	3.55
12	BRAMBLE	3″	1/4″	3/4″	.80
13	BRAMIN	7″	3/8″	2″	2.95
14	BRANCH	6″	1/2″	2″	2.40
15	BRAND	10″	1/2″	3″	4.90
20	BRANGLE	6″	3/8″	1 1/4″	2.40
21	BRASIER	6″	1/4″	1 1/4″	1.90
23	BRAVE	7″	1/2″	1 1/4″	2.95
34	BRAVELY	7″	1/2″	3″	2.95
71	BREATHING	18″	2″	5″	32.50
72	BREECH	18″	3/4″	5″	14.00
73	BREED	18″	1″	5″	17.70
74	BREEZE	18″	1 1/2″	5″	25.10

American Emery Wheel Works

Wheels for BROWN & SHARPE Grinding Machines

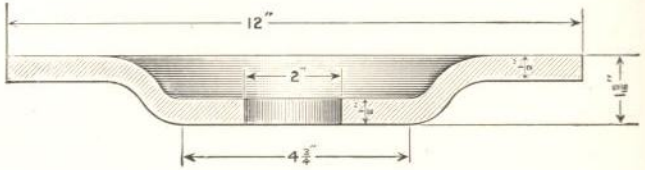
STRAIGHT WHEELS—Continued

SHAPE NO.	CODE WORD	DIAMETER	THICKNESS	HOLE	LIST PRICE
76	BREVIER	12″	3/4″	5″	$7.80
77	BREVITY	12″	1″	5″	9.50
80	BREWER	1/4″	1/4″	3/32″	.40
81	BRIDAL	3/8″	1/4″	3/32	.40
82	BRIDGE	1/2″	1/4″	1/4″	.40
83	BRIEF	3/8″	1/4″	1/4″	.40
84	BRIER	3/4″	1/4″	1/4″	.40
85	BRIGADE	7/8″	1/4″	1/4″	.40
86	BRIGAND	1″	1/4″	1/4″	.40
87	BRIMFUL	1″	3/8″	1/4″	.50
88	BRINDLE	1 1/4″	3/8″	5/8″	.75
89	BRINE	1 1/2″	3/8″	5/8″	.75
90	BRISK	2″	3/8″	3/4″	.75
91	BRISTLE	2 1/2″	3/8″	3/4″	1.00
92	BRISTLING	2 1/2″	1/2″	3/4″	1.00
93	BRITISH	3″	3/4″	3/4″	1.20
95	BRITON	2″	1/4″	1/4″	.60
102	BROGAN	16″	1 1/2″	5″	20.50
104	BROIL	16″	1″	5″	14.60

Wheels for **BROWN & SHARPE** Grinding Machines

OFFSET WHEELS

B. & S. SHAPE No. 4



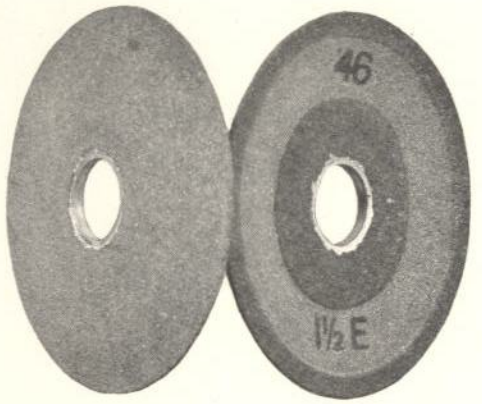
SHAPE NO.	CODE WORD	DIAMETER	FACE THICKNESS	HOLE	LIST PRICE
4	BRACKET	12"	½" Overall Thickness 1 5/16"	2"	$13.10
75	BREVET	12"	½" Overall Thickness 1⅜"	3"	13.10
99	BROKER	4½"	½" Overall Thickness, ¾" Recessed, 1¾" x 5/16"	¾"	2.25
100	BROACH	3½"	⅜" Overall Thickness, ¾" Recessed, 1¾" x 5/16"	¾"	1.65
101	BROCADE	3½"	½" Overall Thickness, ¾" Recessed, 1¾" x 5/16"	¾"	1.65

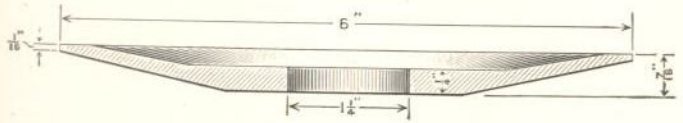
American Emery Wheel Works

Wheels for **BROWN & SHARPE** Grinding Machines

DISH WHEELS

B. &. S. SHAPE No. 26



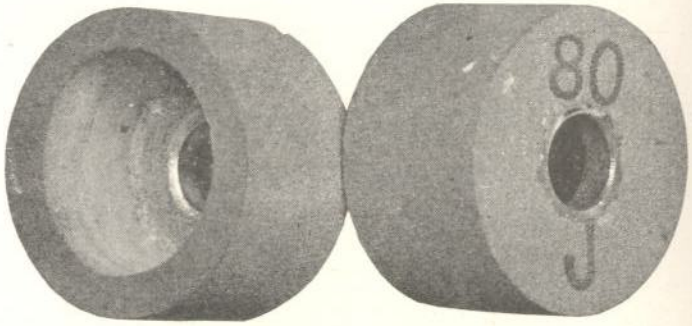


SHAPE NO	CODE WORD	DIAMETER	OVERALL THICKNESS	HOLE	HUB THICKNESS	LIST PRICE
26	BRAVERY	6"	7/16"	1¼"	¼"	$2.40
27	BRAVO	6"	½"	1¼"	11/32"	2.40
32	BRAVADO	8"	¾"	1¼"	½"	4.40
60	BREAM	6"	½"	¾"	11/32"	2.40
61	BREAST	4½"	½"	¾"	11/32"	1.90
62	BREATH	3½"	7/16"	½"	⅜"	1.40

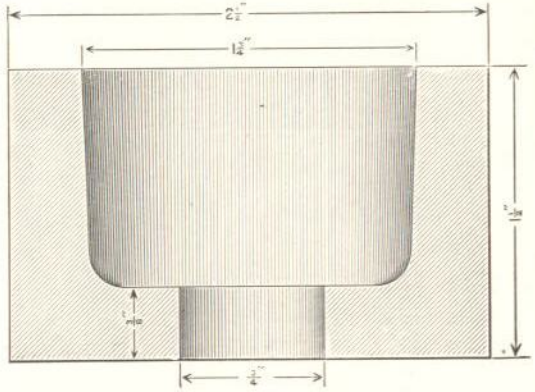
Wheels for **BROWN & SHARPE** Grinding Machines

CUP WHEELS

B. & S.



SHAPE No. 35



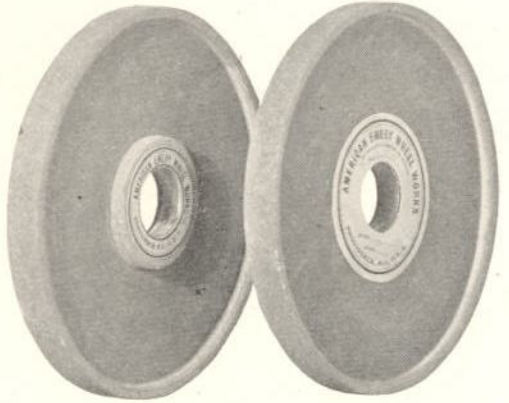
SHAPE NO.	CODE WORD	OUTSIDE DIAMETER	HEIGHT	HOLE	THICKNESS OF RIM	THICKNESS OF BACK	LIST PRICE
35	BRAVET	2½"	1½	¾"	⅜"	⅜"	$1.85
36	BRAVING	3"	1½"	¾"	⅜"	⅜"	1.85
37	BRAVISH	3½"	1¾"	¾"	½"	½"	2.80
50	BRAZEN	4"	1⅜"	1¼"	¼"	½"	2.55
51	BREAD	7"	2"	1¼"	⅜"	⅝"	6.90
52	BREADLE	7"	2"	2"	¾"	½"	6.90
54	BREAKER	7"	2"	3"	21/32"	½"	6.90
56	BREAKFAST	8"	2⅝"	3"	¾"	⅝"	11.15

American Emery Wheel Works

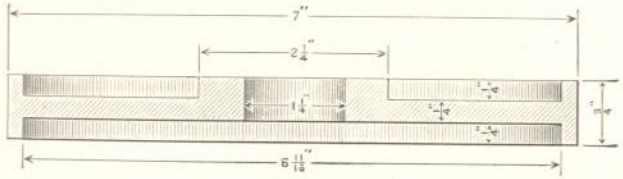
Wheels for **BROWN & SHARPE** Grinding Machines

RECESSED WHEELS

B. & S.

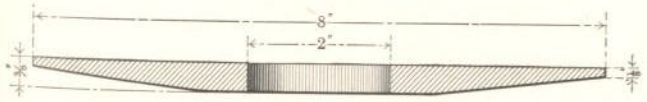


SHAPE No. 39



SHAPE NO.	CODE WORD	DIAMETER	THICKNESS	HOLE	LIST PRICE
39	BRAWLING	7"	¾"	1¼"	$3.60
		Recesses and Raised Hub as Above Diagram			
114	BROILER	20"	3"	5"	58.00
		Recessed One Side, 10" x 1"			

TAPERED WHEELS



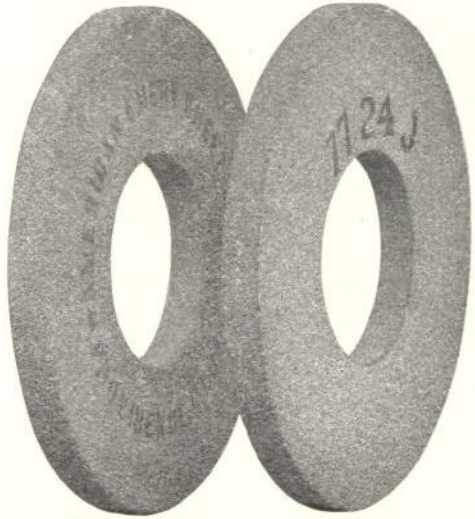
B. & S. SHAPE No. 48

SHAPE NO.	CODE WORD	DIAMETER	THICKNESS	HOLE	LIST PRICE
47	BRAWL	7"	¼"	¾"	$2.30
		Tapered Both Sides to ¼" Face			
48	BRAWNY	8"	⅛"	2"	3.55
		Tapered One Side to ⅛" Face			

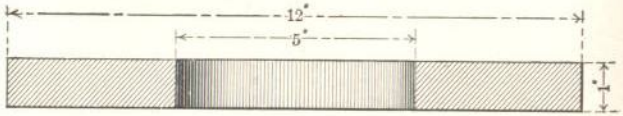
Wheels for **LANDIS** Grinding Machines

STRAIGHT WHEELS

LANDIS



SHAPE No. 72



SHAPE NO.	CODE WORD	DIAMETER	THICKNESS	HOLE	LIST PRICE
30	LABIAL	3/16"	1/4"	3/32"	$ .40
31	LACE	1/4"	1/4"	1/8"	.40
32	LACKEY	3/16"	1/4"	3/16"	.40
33	LACONIC	1/2"	1/4"	1/4"	.40
52	LAMMAS	10"	1/2"	4 3/4"	4.90
53	LAMPOON	10"	5/8"	4 3/4"	6.20
70	LANDAU	12"	1/2"	5"	6.00
71	LANDED	12"	3/4"	5"	7.80
72	LANGUID	12"	1"	5"	9.50
76	LAPPET	14"	3/4"	5"	9.60
77	LAPSE	14"	1"	5"	11.90
102	LATERAL	18"	1"	8"	17.70
103	LATIN	18"	1 1/4"	8"	21.40
104	LATISH	18"	1 1/2"	8"	25.10

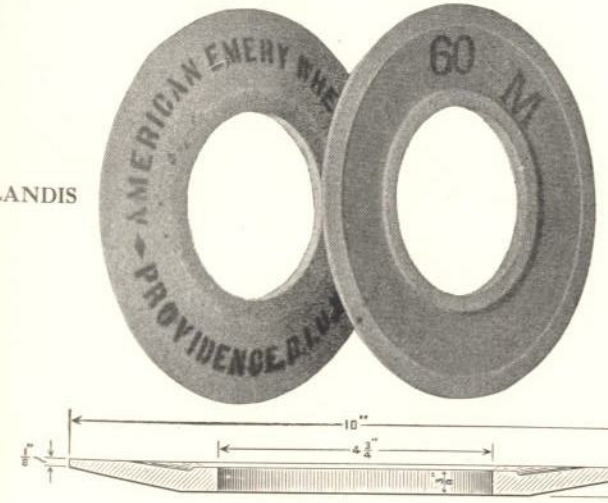
Wheels for **LANDIS** Grinding Machines

STRAIGHT WHEELS—Continued

SHAPE NO.	CODE WORD	DIAMETER	THICKNESS	HOLE	LIST PRICE
107	LATTER	20"	1 1/2"	8"	$30.50
111	LAURAL	24"	2"	12"	53.45
145	LAZORT	3/8"	1/4"	1/4"	.45
233	LOVER	3/8"	5/16"	1/4"	.50
235	LOWER	1"	5/16"	7/16"	.50
237	LOWERY	1"	7/16"	3/8"	.50
239	LOWING	1 1/2"	7/16"	9/16"	.75
241	LOWLY	1 1/2"	9/16"	7/16"	.90
242	LOYAL	2"	9/16"	7/16"	.90
243	LUBBER	2 1/2"	9/16"	1/2"	1.20
244	LUCENT	2"	11/16"	1"	.90
245	LUCID	2 1/2"	11/16"	1"	1.20
246	LUCKY	3"	11/16"	1"	1.20
247	LUCRE	3 1/2"	11/16"	1 1/4"	1.90
248	LUFF	4 1/2"	1"	1 1/4"	2.65
249	LUG	6"	1"	1 1/2"	3.40
354	LUGGER	18"	1 1/4"	8"	25.10
490	LULL	10"	5/16"	5"	4.90
491	LUMBER	10"	1/2"	5"	4.90
492	LUMP	10"	1"	5"	4.90
493	LUNA	10"	1"	5"	6.20
495	LUNCH	10"	1"	5"	6.20
497	LURCH	1 1/4"	1"	1/4"	.60
498	LURID	1 3/4"	1"	1/4"	.75
514	LURK	14"	1"	5"	11.90

DISH WHEELS

LANDIS



SHAPE No. 54

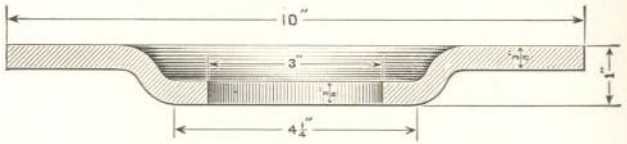
SHAPE NO.	CODE WORD	DIAMETER	OVERALL THICKNESS	HOLE	LIST PRICE
54	LAMPREY	10"	1/2"	4 3/4"	$4.90
73	LANGUOR	12"	5/8"	5"	7.80
494	LANKY	10"	1/2"	5"	4.90

Wheels for **LANDIS** Grinding Machines

OFFSET WHEELS

LANDIS

SHAPE No. 55



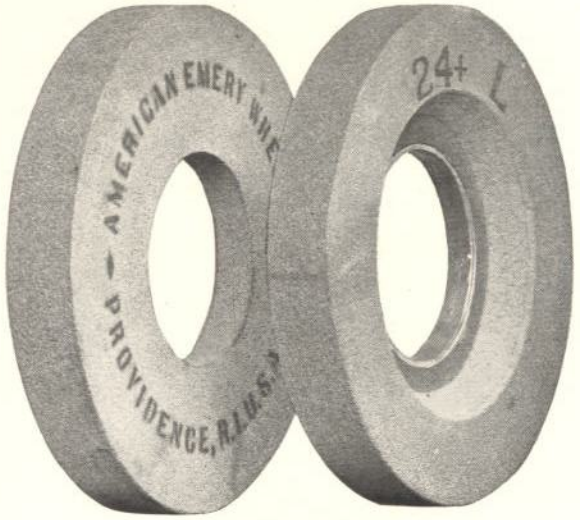
SHAPE NO.	CODE WORD	DIAMETER	FACE THICKNESS	HOLE	LIST PRICE
55	LANCEL	10"	⅜" Overall Thickness, 1"	3"	$7.50
74	LANTERN	12"	½" Overall Thickness, 1⅜"	3"	13.10

Wheels for **LANDIS** Grinding Machines

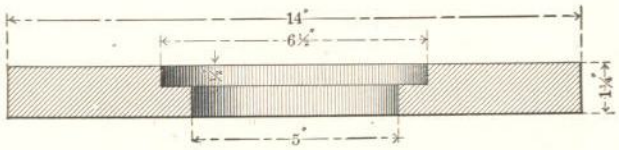
RECESSED WHEELS

(One Side)

LANDIS



SHAPE No. 126

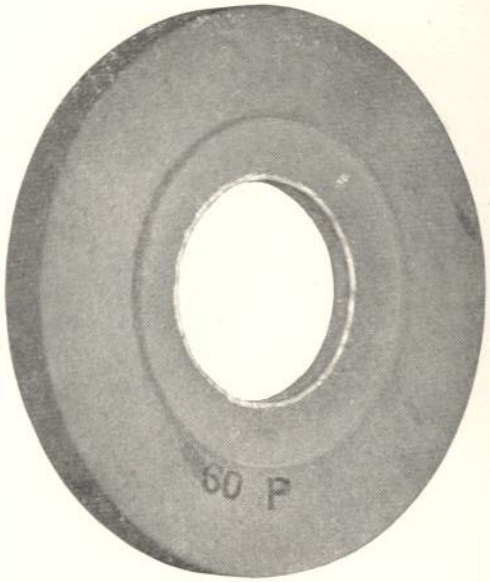


SHAPE NO.	CODE WORD	DIAMETER	THICKNESS	HOLE	SIZE OF RECESS	LIST PRICE
56	LANDING	10"	¾"	4¾"	5⅛"x⅜"	$6.20
113	LAVENDER	24"	2½"	12"	15" x⅜"	64.25
123	LAWFUL	18"	1½"	8"	10⅛"x½"	25.10
126	LAWLESS	14"	1¼"	5"	6⅛"x½"	14.20
133(Old)	LAYER	18"	2"	8"	10½"x½"	32.50
215	LONELY	24"	2"	8"	10⅝"x¼"	59.00
348	LOOSE	20"	2"	8"	10¼"x½"	39.60
394	LORE	18"	1¾"	8"	10¼"x¼"	28.80
459	LORRY	26"	1½"	12"	15" x⅜"	48.15
496	LOTH	10"	1½"	5"	6⅛"x¾"	10.20
512	LOUDLY	5⅛"	⅜"	1½"	2¾"x⅛"	3.40
513	LOUT	3⅛"	⅜"	1½"	2¾"x⅛"	1.95

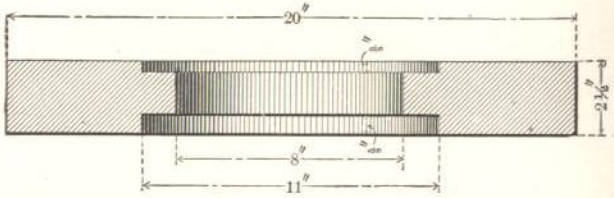
Wheels for LANDIS Grinding Machines

RECESSED WHEELS
(Both Sides)

LANDIS



SHAPE No. 109



SHAPE NO.	CODE WORD	DIAMETER	THICKNESS	HOLE	SIZE OF RECESS INSIDE	SIZE OF RECESS OUTSIDE	LIST PRICE
108	LATTICE	20″	2″	8″	11″ x 1/4″	11″ x 1/4″	$39.60
109	LAUGH	20″	2½″	8″	11″ x 3/8″	11″ x 3/8″	48.70
109A	LAUGHING	20″	3″	8″	11″ x 3/4″	11″ x 3/8″	58.00
112	LAVA	24″	3″	12″	15″ x 3/4″	15″ x 1/2″	77.05
127	LAWN	18″	2½″	8″	10¾″x 3/8″	10¾″x 3/8″	39.80
129	LAXIVAL	24″	3½″	12″	15″ x1¼″	15″ x 1/2″	89.90
130	LAXIZE	24″	4″	12″	15″ x1¾″	15″ x 1/2″	102.70
133(New)	LAZAR	18″	2″	8″	10¾″x 3/8″	10¾″x 1/8″	32.50
140	LAZARET	30″	3″	14″	17¼″x 1/2″	17¼″x 1/2″	121.85

American Emery Wheel Works

Wheels for LANDIS Grinding Machines

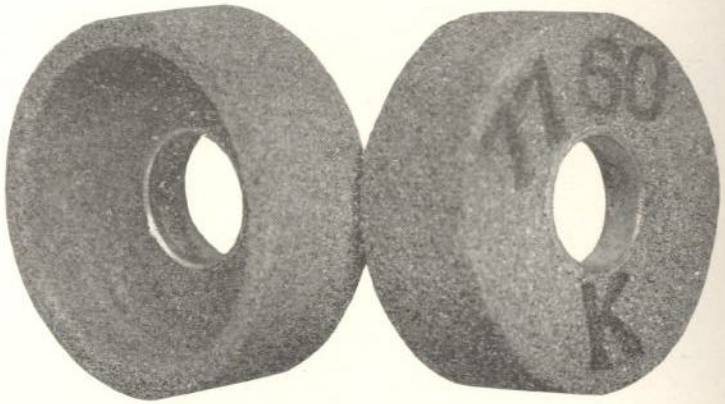
RECESSED WHEELS
(Both Sides)—Continued

SHAPE NO.	CODE WORD	DIAMETER	THICKNESS	HOLE	SIZE OF RECESS INSIDE	SIZE OF RECESS OUTSIDE	LIST PRICE
141	LAZILY	30″	4″	14″	17¼″x 1/2″	17¼″x1″	$160.75
142	LAZING	30″	5″	14″	17¼″x 1/2″	17¼″x1½″	200.90
166	LOACH	18″	3″	8″	10½″x 3/4″	10½″x 1/2″	47.20
184	LOBSTER	14″	1½″	5″	7¼″x 7/16″	7¼″x 3/16″	16.50
185	LOBULE	14″	2″	5″	7¼″x 7/16″	7¼″x 3/16″	21.20
211	LOFTY	24″	3″	8″	10⅝″x 1/2″	10⅝″x 3/4″	85.00
212	LOGGER	24″	4″	8″	10⅝″x 1/2″	10⅝″x1¾″	113.00
271	LOTUS	24″	1½″	12″	15″ x 3/8″	15″ x 3/8″	39.65
275	LOUD	24″	2″	12″	15″ x 7/16″	15″ x 7/16″	53.45
277	LOUNGE	24″	2¼″	12″	15″ x 1/2″	15″ x 1/2″	58.85
279	LOUSE	24″	2½″	12″	15″ x 9/16″	15″ x 5/8″	64.25
347	LOUT	20″	2½″	8″	10¾″x 5/8″	10¾″x 3/4″	48.70
355	LOXIC	18″	5½″	8″	11¼″x 3/8″	11¼″x2¾″	85.25
360	LOZENGE	18″	5″	8″	11¼″x 3/8″	11¼″x2¾″	77.50
361	LUBECK	20″	3″	8″	10¾″x 5/8″	10¾″x 7/8″	58.00
364	LUCERNE	18″	4″	8″	11¼″x 3/8″	11¼″x1⅜″	62.00
372	LUCIFER	18″	6″	8″	11¼″x 3/8″	11¼″x3¾″	93.00
373	LUDO	14″	3″	5″	7½″x 3/16″	7½″x1 7/16″	30.50
383	LUGGAGE	18″	3″	8″	11¼″x 3/4″	11¼″x1⅛″	47.20
385	LUKE	18″	3½″	8″	11¼″x 3/4″	11¼″x 7/8″	54.60
386	LUNATE	14″	2″	5″	7¼″x 3/16″	7¼″x 13/16″	21.20
387	LUNG	20″	4″	8″	11¼″x 3/8″	11¼″x1⅛″	76.00
388	LUPINE	20″	5½″	8″	11¼″x 3/8″	11¼″x2⅜″	104.50
392	LUPUS	14″	1¼″	5″	7¼″x 3/16″	7¼″x 3/16″	14.20
393	LURE	14″	2½″	5″	7¼″x 3/16″	7¼″x 13/16″	25.80
396	LUSH	18″	4½″	8″	14¼″x 3/8″	14¼″x1⅞″	69.75
397	LUST	20″	3½″	8″	11¼″x 5/8″	11¼″x 5/8″	67.00
398	LUTE	20″	4½″	8″	11¼″x 5/8″	11¼″x1⅝″	85.50
399	LUXATE	20″	5″	8″	11¼″x 5/8″	11¼″x2¼″	95.00
400	LUXURY	20″	6″	8″	11¼″x 5/8″	11¼″x3¼″	114.00
401	LYCEUM	20″	6½″	8″	11¼″x 5/8″	11¼″x3⅝″	123.50
402	LYCOPIN	20″	7″	8″	11¼″x 5/8″	11¼″x4¼″	133.00
403	LYDDITE	20″	7½″	8″	11¼″x 5/8″	11¼″x4⅝″	142.50
438	LYDIAN	26″	2¾″	12″	15″ x 3/8″	15″ x 3/4″	85.70
439	LYE	26″	2¾″	12″	15″ x 3/8″	15″ x 3/4″	93.10
440	LYING	26″	3″	12″	15″ x 3/8″	15″ x 7/8″	93.10
460	LYMPH	26″	1¾″	12″	15″ x 1/4″	15″ x 3/8″	56.05
461	LYNCH	26″	1¾″	12″	15″ x 3/8″	15″ x 3/8″	63.45
462	LYNCID	26″	2″	12″	15″ x 1/2″	15″ x 3/8″	63.45
463	LYNX	26″	2¼″	12″	15″ x 3/8″	15″ x 3/8″	70.85
464	LYRA	26″	2¼″	12″	15″ x 3/8″	15″ x 1/2″	70.85
465	LYRIC	26″	2¾″	12″	15″ x 3/8″	15″ x 3/8″	78.25
466	LYSIN	26″	2½″	12″	15″ x 3/8″	15″ x 1/2″	78.25
467	LYTIC	14″	4″	5″	7½″x 3/16″	7½″x2 7/16″	39.80

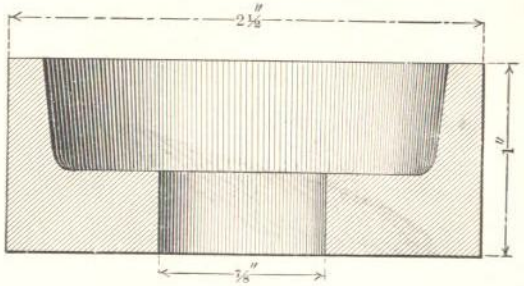
Wheels for LANDIS Grinding Machines

CUP WHEELS

LANDIS



SHAPE No. 120

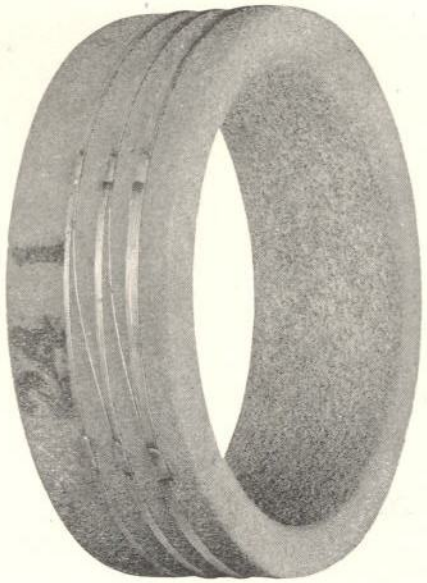


SHAPE NO.	CODE WORD	DIAMETER	HEIGHT	HOLE	THICKNESS OF RIM	THICKNESS OF BACK	LIST PRICE
120	LAVITEL	2½"	1"	⅞"	3/16"	7/16"	$1.45
121	LAVIVE	3½"	1"	⅞"	3/16"	7/16"	1.95

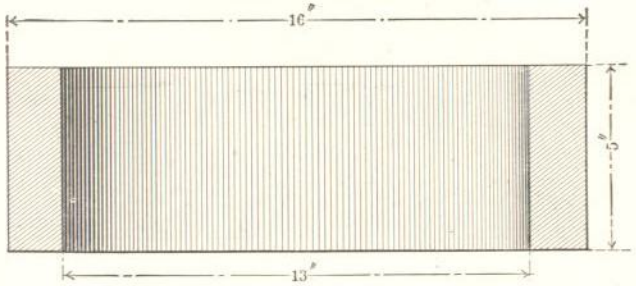
Wheels for BLANCHARD Grinding Machines

VERTICAL SURFACE GRINDERS

BLANCHARD



SHAPE No. 30



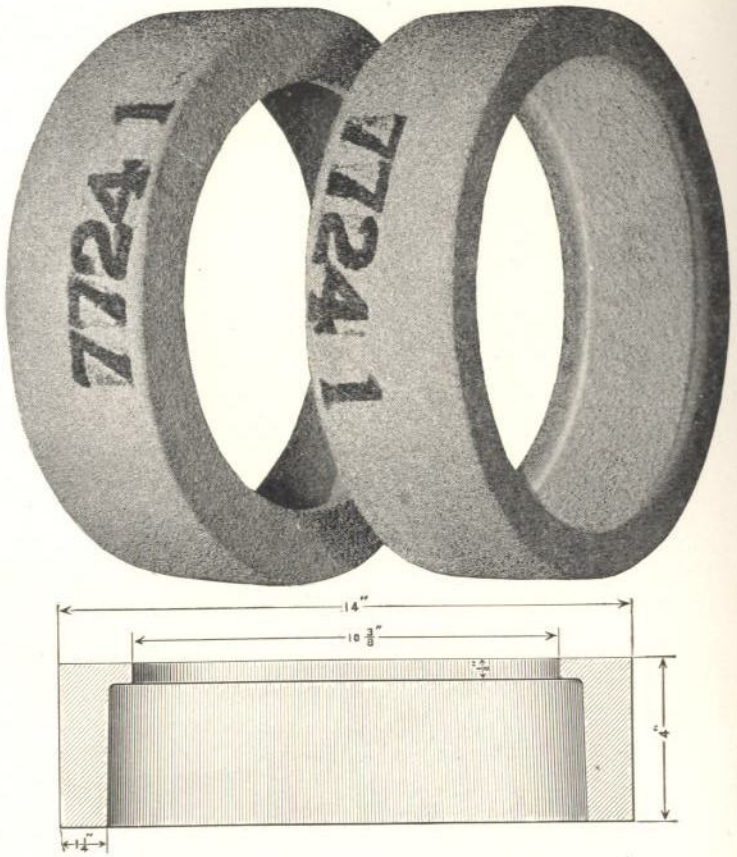
SHAPE NO.	CODE WORD	DIAMETER	THICKNESS	HOLE	THICKNESS OF RIM	LIST PRICE
		(For Belted Machines)				
30	BLAME	16"	5"	13"	1½"	$43.80
31	BLAND	16"	5"	13½"	1¼"	43.80
		(For Direct Motor Driven Machines)				
34	BLAST	18"	5"	15"	1½"	54.30
35	BLATE	18"	5"	15½"	1¼"	54.30
		(For Both Belt and Direct Motor Drive)				
36	BLAZER	10"	4"	8"	1"	18.90

NOTE.—Above wheels are banded with wire for which cost price is charged.

Wheels for PRATT & WHITNEY Grinding Machines

VERTICAL SURFACE GRINDERS

P. & W.



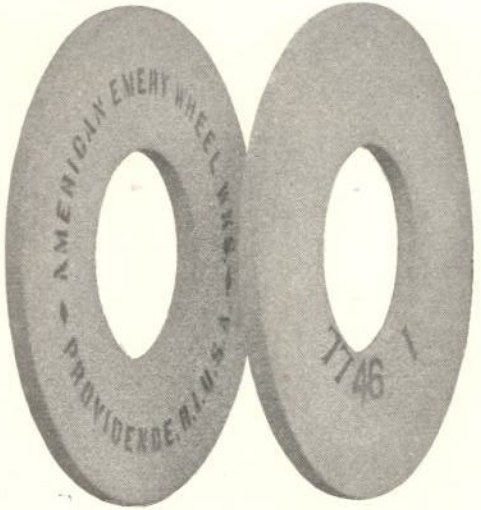
SHAPE No. 23

SHAPE NO.	CODE WORD	DIAMETER	HEIGHT	HOLE	RIM THICKNESS AT FACE	THICKNESS OF BACK	LIST PRICE
21	PRATT	12″	4″	8¼″	1¼″	½″	$27.30
23	PRANCE	14″	4″	10⅜″	1½″	½″	34.20
28	PRANK	22″	4″	17⅞″	1¾″	½″	78.35
31	PRATIC	30″	7¾″	24″	2″	1″	237.25
			(Rotary Surface Grinder)				
32	PRAN	22″	4″	17¾″	1¾″	½″	78.35
33	PRAISE	8″	3″	4″	⅝″	9/16″	12.00
			(Spline Miller Cutter Grinder)				
Fishtail Cutter Grinder	PRAWN	2¼″	11/16″	⅜″	¼″	3/16″	1.20

Wheels for PRATT & WHITNEY Grinding Machines

SIZING GRINDERS

P. & W.



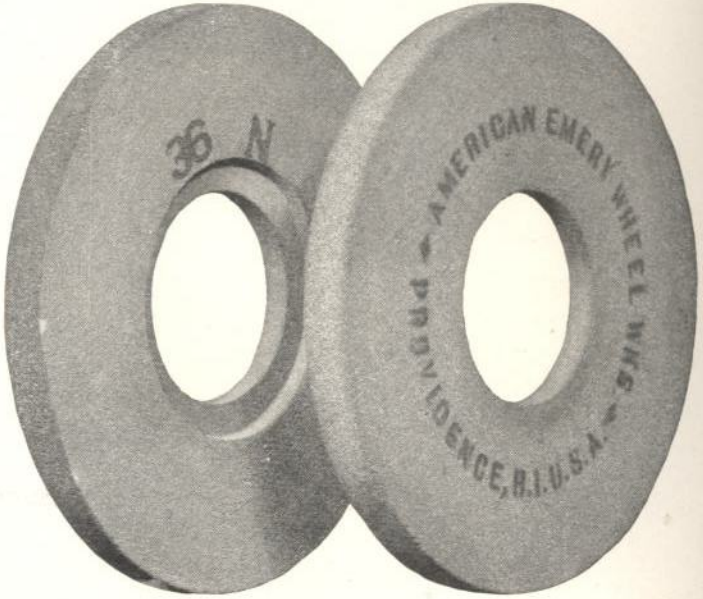
SHAPE No. 51

SHAPE NO.	CODE WORD	DIAMETER	THICKNESS	HOLE	LIST PRICE
51	PRAYER	12″	½″	5″	$6.00
52	PREACH	12″	¾″	5″	7.80
53	PRECEPT	12″	1″	5″	9.50
54	PREEN	12″	1¼″	5″	11.30

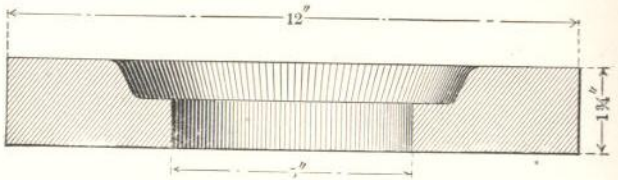
Wheels for PRATT & WHITNEY Grinding Machines

SIZING GRINDERS

P. & W.



SHAPE No. 56



SHAPE NO.	CODE WORD	DIAMETER	THICKNESS	HOLE	RECESSED ONE SIDE	LIST PRICE
56	PRELUDE	12″	1¼″	5″	7¼″x ¾″	$14.90
57	PRESAGE	12″	2″	5″	6⅜″x1″	16.70
58	PRESENT	12″	2½″	5″	6⅜″x1½″	20.20

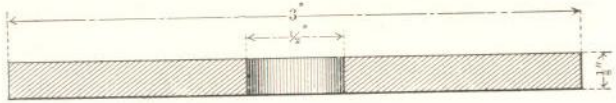
Wheels for CINCINNATI MILLING MACHINE CO. Grinding Machines

(CUTTER AND TOOL GRINDER)

STRAIGHT WHEELS

CINCINNATI

SHAPE No. 1



SHAPE NO.	MACHINE NO.	CODE WORD	DIAMETER	THICKNESS	HOLE	LIST PRICE
1	1	CIDER	3″	⅛″	½″	$ .80
5	1	CITADEL	6″	⅛″	½″	1.90
6	1	CITRIC	⅞″	¼″	¼″	.40
7	1	CITRON	8″	1/16″	½″	2.70
9	2	CINGLE	1″	¼″	¼″	.40
10	2	CINQUE	4″	¼″	¾″	1.10
11	2	CIRCLE	6″	⅜″	¾″	2.40
12	2	CITE	10″	½″	¾″	4.90
17	1½	CITY	6″	½″	½″	2.40

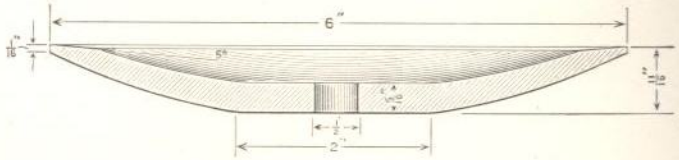
Wheels for CINCINNATI MILLING MACHINE CO. Grinding Machines

(CUTTER AND TOOL GRINDER)

DISH WHEELS

CINCINNATI

SHAPE No. 3



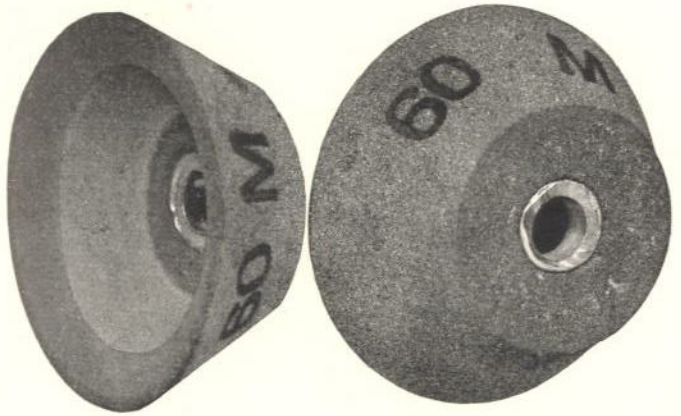
SHAPE NO.	MACHINE NO.	CODE WORD	DIAMETER	OVERALL THICKNESS	HOLE	LIST PRICE
3	1 or 1½	CIPHER	6″	11/16″	½″	$2.90
16	2	CIVES	6″	⅞″	¾″	3.40

American Emery Wheel Works

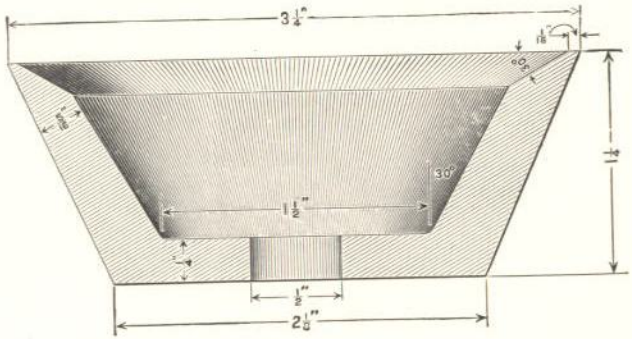
Wheels for CINCINNATI MILLING MACHINE CO. Grinding Machines

CUP WHEELS

CINCINNATI



SHAPE No. 2

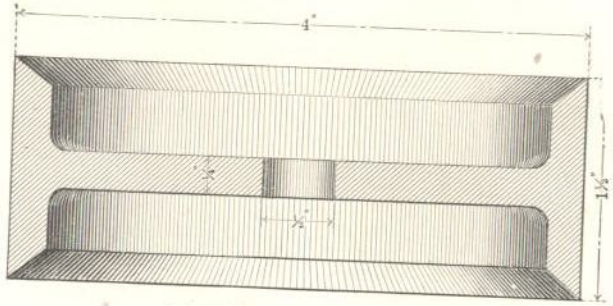


SHAPE NO.	MACHINE NO.	CODE WORD	DIAMETER	HEIGHT	HOLE	RIM AT FACE	THICKNESS OF BACK	LIST PRICE
2	1&1½	CIGAR	3¼″	1¼″	½″	1/16″	¼″	$2.25
4	1	CIRCUS	5″	1½″	½″	3/32″	1/16″	3.40
13	2	CIVET	4″	1⅝″	¾″	3/32″	½″	2.55
14	2	CITRIL	6″	2″	¾″	3/32″	½″	5.40

Wheels for CINCINNATI MILLING MACHING CO. Grinding Machines

(CUTTER AND TOOL GRINDER)

DOUBLE CUP WHEELS



CINCINNATI SHAPE No. 8

SHAPE NO.	MACHINE NO.	CODE WORD	DIAMETER	HEIGHT	HOLE	RIM AT FACE	THICKNESS OF BACK	LIST PRICE
8	1	CIVIL	4″	1½″	⅝″	¼″	¼″	$2.55
15	2	CITRINE	4″	1½″	¾″	¼″	⅜″	2.55

NOTE.—Numbers 10, 11, 12, 13, 14, 15, 16 and 17 will be fitted with steel bushings if so ordered.

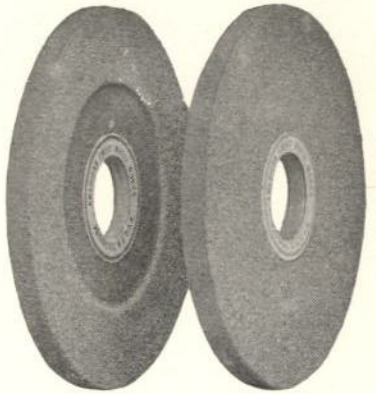
Price of steel bushings, 10c. each, net.

American Emery Wheel Works

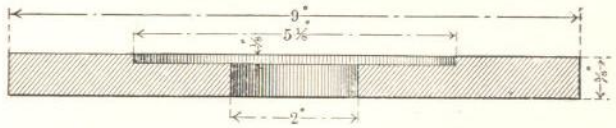
Wheels for HEALD Grinding Machines

(8″ ROTARY SURFACE GRINDER)

HEALD



SHAPE No. 18



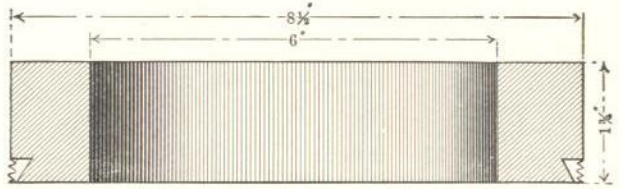
SHAPE NO.	CODE WORD	DIAMETER	THICKNESS	HOLE	RECESSED ONE SIDE	LIST PRICE
16	HEART	7″	½″	2″	4″ x ⅛″	$2.95
17	HEATH	8″	½″	2″	4″ x 1/16″	3.55
18	HEDGE	9″	⅜″	2″	5⅛″x ⅛″	5.20
61	HEED	10″	1″	3½″	not recessed	7.50
			(12″ Rotary Surface Grinder)			
81	HEIR	12″	1″	5″	not recessed	9.50
			(16″ Rotary Surface Grinder)			
44	HINGE	14″	1¼″	5″	not recessed	14.20
			(Cylinder and Internal Grinder)			
23	HEEL	3½″	¾″	1¼″	2 1/16″x 1/16″	1.65
27	HERO	4″	¾″	1¼″	2 1/16″x 1/16″	1.65
45	HIPPO	¾″	⅝″	¼″	Not Recessed	.60
46	HIRSUTE	1″	⅝″	¼″	" "	.60
50	HIRUDO	2½″	¾″	⅛″	" "	1.20
52	HISS	1½″	¾″	⅜″	" "	.90
53	HIT	2″	¾″	⅜″	" "	.90
54	HIVE	1″	¾″	⅜″	" "	.60
55	HOARD	1¼″	¾″	⅜″	" "	.90
66	HOARSE	⅜″	5/16″	¼″	¼″x 7/64″	.50

Wheels for HEALD Grinding Machines

(CYLINDER AND INTERNAL GRINDER)—Continued

SHAPE NO.	CODE WORD	DIAMETER	THICKNESS	HOLE	RECESSED ONE SIDE	LIST PRICE
84	HOARY	2¾″	1¼″	⅞″	1⅛″x ⅜″	$1.65
85	HOB	1¾″	7/16″	⅜″	1″ x ½″	1.00
89	HOBBLE	1¾″	1¾″	⅜″	not recessed	1.45
94	HOBO	4½″	1″	1¼″	2⅛″x ½″	2.65
100	HOCK	4½″	2¼″	1½″	3″ x1¼″	4.55
103	HOCUS	6″	¾″	2″	not recessed	2.90
123	HOD	3½″	1″	1¼″	2 5/16″x 5/16″	1.95
127	HOE	4″	1″	1¼″	2 5/16″x 5/16″	1.95
150	HOIST	2½″	1″	7/16″	1⅛″x ⅜″	1.45
151	HOLD	3″	1″	⅞″	1⅛″x ⅜″	1.45
152	HOLLOW	1½″	1½″	7/16″	13/16″x ⅝″	1.15
153	HOLLY	12″	¾″	2″	not recessed	7.80
154	HOLSTER	8″	¾″	2″	not recessed	4.40
155	HOME	1″	¾″	⅜″	5/16″x ⅜″	.60

AMERICAN DRILL GRINDER

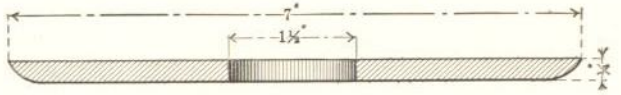


FORMERLY HEALD	CODE WORD	DIAMETER	THICKNESS	HOLE	LIST PRICE
SHAPE NO. 1	AMBIT	8½″	1¾″	6″	$9.50

(LaSalle Machine & Tool Co.)

Special Threaded Bushing for Above, $.50 net.

AMERICAN GRINDER POINT THINNING WHEEL



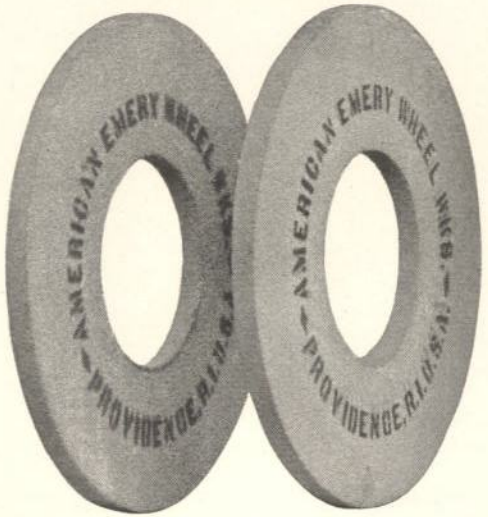
FORMERLY HEALD	CODE WORD	DIAMETER	THICKNESS	HOLE	LIST PRICE
SHAPE NO. 2	ARMOUR	7″	¼″	1½″	$2.30

(LaSalle Machine & Tool Co.)

Wheels for BATH Grinding Machines

STRAIGHT WHEELS

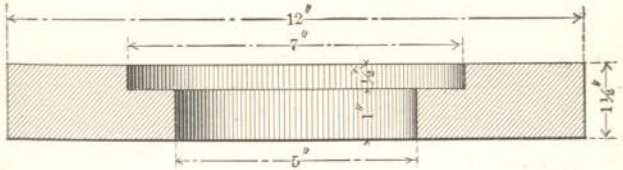
BATH



SHAPE No. 1

SHAPE NO.	CODE WORD	DIAMETER	HEIGHT	HOLE	LIST PRICE
1	BADGER	12″	1¾″	5″	$7.80
2	BAIZE	12″	1″	5″	6.00
10	BANNER	6″	1¾″	1¼″	1.90
11	BANTAM	3″	1¾″	¾″	.80
12	BARBER	1½″	1¾″	¾″	.75
13	BARLEY	1″	1¾″	¾″	.40
14	BARREN	¾″	1¾″	¾″	.40
22	BAYONET	12″	1″	5″	9.50
28	BAKE	8″	1¾″	1¼″	4.40
29	BALLET	8″	1¾″	1¼″	3.55
42	BALLOT	10″	1¾″	3″	6.20
44	BALM	10″	1¾″	3″	4.90

RECESSED WHEEL

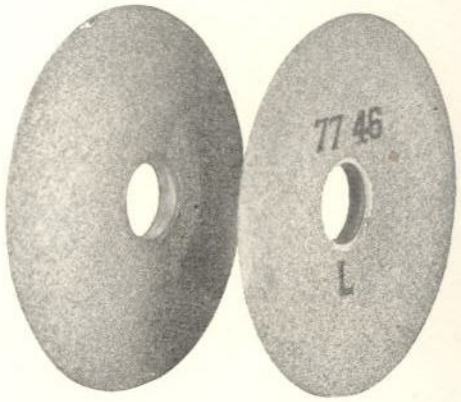


SHAPE NO.	CODE WORD	DIAMETER	HEIGHT	HOLE	RECESSED ONE SIDE	LIST PRICE
26	BAFFLE	12″	1½″	5″	7″ x ½″	$13.10

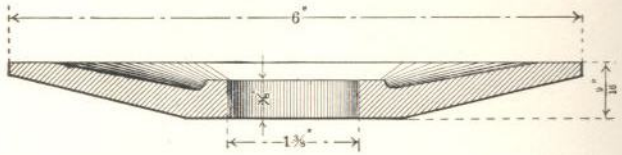
Wheels for **BATH** Grinding Machines

DISH WHEELS

BATH

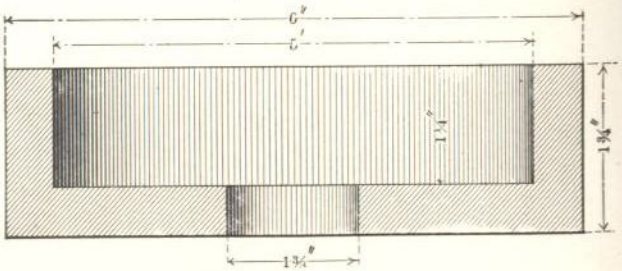


SHAPE No. 16



SHAPE NO.	CODE WORD	DIAMETER	OVERALL THICKNESS	HOLE	PRICE LIST
16	BASIL	6″	1 1/8″	1 1/8″	$2.90
21	BATEAU	12″	1 1/8″	5″	11.30

CUP WHEELS

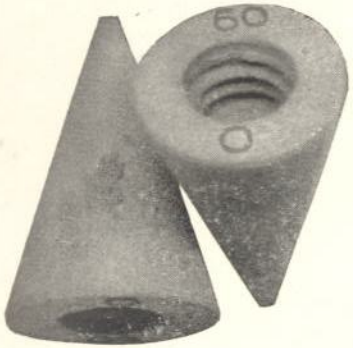


BATH SHAPE No. 27

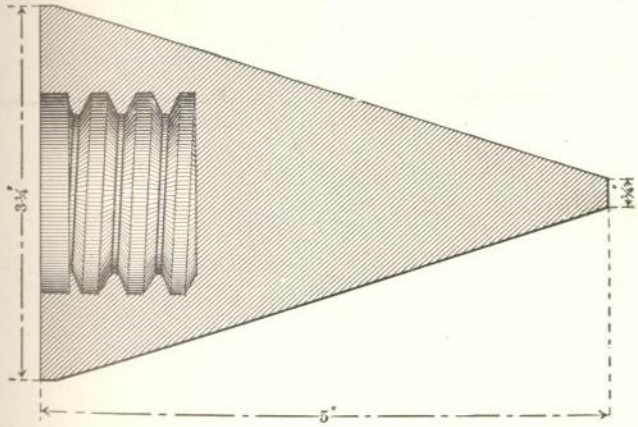
SHAPE NO.	CODE WORD	DIAMETER	HEIGHT	HOLE	THICKNESS OF RIM	THICKNESS OF BACK	PRICE LIST
23	BATHOS	3 1/4″	1 1/2″	1/4″	1/4″	5/16″	$2.55
24	BAUBLE	8″	3 1/2″	5″	3/8″	1/4″	13.70
27	BAGPIPE	6″	1 3/4″	1 1/4″	1/2″	1/2″	4.95

Wheels for **WALKER** Grinding Machines

WALKER



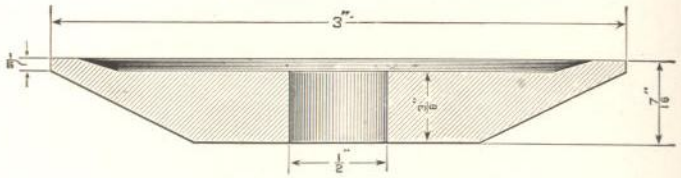
CONES
SHAPE No. 5



SHAPE NO.	CODE WORD	DIAMETER	HEIGHT	HOLE	LIST PRICE
5W	WAGON	3 1/4″	5″	1 7/16″	$6.75

Wheels for WALKER Grinding Machines

DISH WHEELS

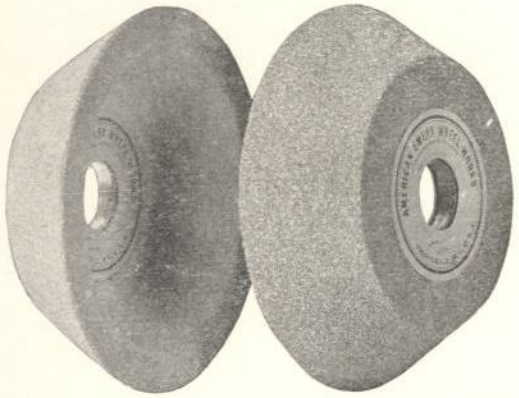


SHAPE NO.	CODE WORD	DIAMETER	OVERALL THICKNESS	HOLE	LIST PRICE
1W	WADDLE	3″	7/16″	1/2″	$1.00
2W	WAFER	3½″	3/8″	1/2″	1.40
3W	WAFFLE	4½″	11/32″	1/2″	1.90
10W(coarse)	WAGER	6″	5/8″	1¼″	2.90
30W(fine)	WAGGLE	6″	5/8″	1¼″	2.90

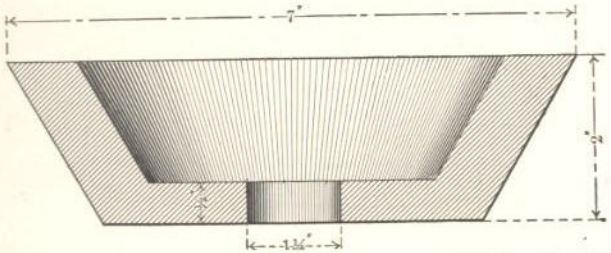
Wheels for WALKER Grinding Machines

CUP WHEELS

WALKER

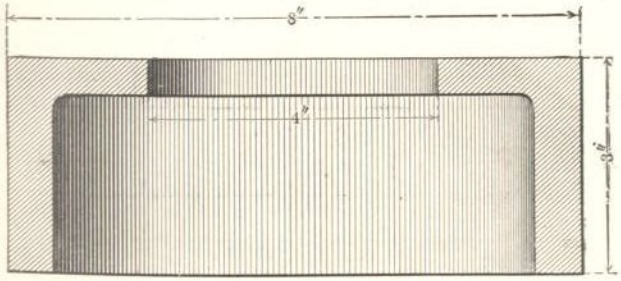


SHAPE No. 15



SHAPE NO.	CODE WORD	DIAMETER	HEIGHT	HOLE	THICKNESS OF RIM	THICKNESS OF BACK	LIST PRICE
15W	WALTZ	7″	2″	1¼″	3/4″	1/2″	$6.90
28W(coarse)	WANTON	4″	1 3/32″	1¼″	1/4″	5/16″	2.55
29W(fine)	WARBLE	4″	1 3/32″	1¼″	1/4″	5/16″	2.55
41A(coarse)	WASHY	4½″	2″	1¼″	5/16″	5/16″	4.15
42A(fine)	WASTE	4½″	2″	1¼″	5/16″	1/2″	4.15

(VERTICAL SURFACE GRINDEP)



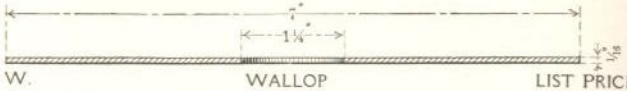
59	WAYWARD	8″	3″	4″	5/8″	5/16″	$12.00

Wheels for WALKER Grinding Machines

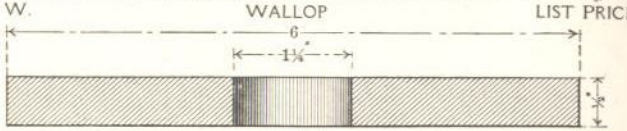
STRAIGHT AND TAPERED WHEELS

SHAPE 8 W. — WAIST — LIST PRICE $1.50

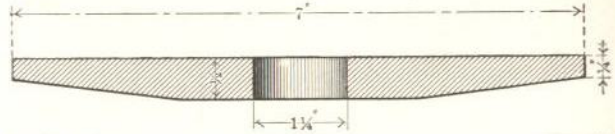
SHAPE 11 W (No. 90, Grade J) — WAIVE — LIST PRICE $2.40
SHAPE 17 W (No. 100, Grade I) — WALLET — LIST PRICE $2.40



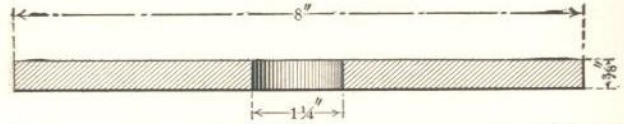
SHAPE 12 W. — WALLOP — LIST PRICE $2 30



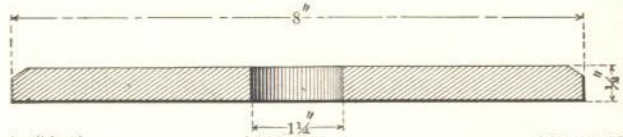
SHAPE 14 W (Coarse) — WALNUT — LIST PRICE $2.40
SHAPE 31 W (Fine) — WALRUS — LIST PRICE $2.40



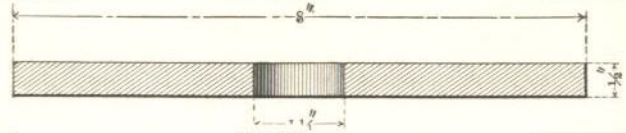
SHAPE 21 W (Coarse) — WAMPUM — LIST PRICE $2.95
SHAPE 32 W (Fine) — WANDER — LIST PRICE $2.95



SHAPE 40 A — WARY — LIST PRICE $3 55



SHAPE 47 A. (Hard) — WASTEL — LIST PRICE $3.55
SHAPE 48 A. (Soft) — WATTLE — LIST PRICE $3.55

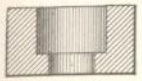


SHAPE 49 A. — WAVY — LIST PRICE $3.55

Wheels for WALKER Grinding Machines

INTERNAL WHEELS

(Recessed)



SHAPE NO.	CODE WORD	DIAMETER	THICKNESS	HOLE	RECESS	LIST PRICE
22W	WARDEN	⅜″	¼″	⅛″	¼″ x 5/32″	$.40
23W	WARILY	7/16″	¼″	⅛″	¼″ x 5/32″	.40
24W	WARMTH	7/16″	¼″	⅛″	¼″ x 5/32″	.40
25W	WARNING	7/16″	¼″	⅛″	¼″ x 5/32″	.40
26W	WARRANT	13/16″	¼″	⅛″	¼″ x 5/32″	.40
27W	WARREN	13/16″	¼″	⅛″	¼″ x 5/32″	.40
33W	WARRIOR	11/16″	⅜″	¼″	3/32″ x 5/32″	.50
34W	WASHER	13/16″	⅜″	¼″	13/32″ x 5/32″	.50
35W	WASPISH	13/16″	⅜″	¼″	13/32″ x 5/32″	.50
36W	WATCH	1 1/16″	⅜″	¼″	13/32″ x 5/32″	.75
37W	WAVER	1 3/16″	⅜″	¼″	13/32″ x 5/32″	.75
38W	WAXEN	1 5/16″	⅜″	¼″	13/32″ x 5/32″	.75
39W	WAYLAY	1 7/16″	⅜″	¼″	13/32″ x 5/32″	.75

Wheels for QUEEN CITY Grinding Machines

STRAIGHT WHEELS

SHAPE NO.	CODE WORD	DIAMETER	THICKNESS	HOLE	LIST PRICE
1	QUEEN	24″	3″	8″	$85.00
2	QUELL	24″	2″	8″	59.00
3	QUENCH	20″	3″	8″	58.00
4	QUERN	18″	3″	8″	47.20

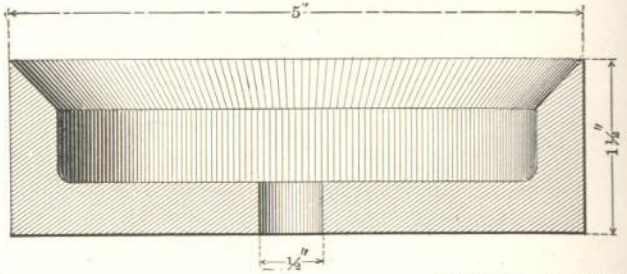
RECESSED WHEELS

(One Side)

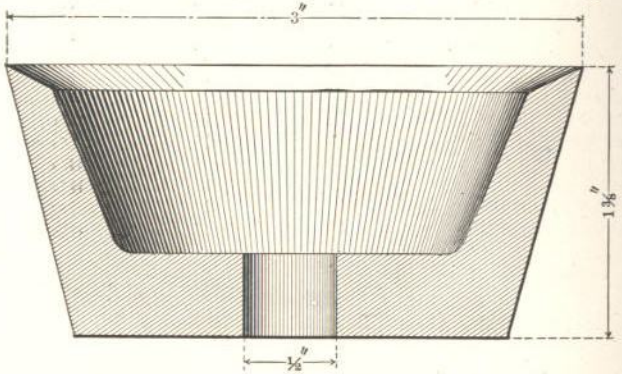
				RECESSED	
5	QUEST	18″	6″	8″ 10½″x3″	93.00
6	QUICK	18″	5″	8″ 10½″x2″	77.50

Wheels for LE BLOND Grinding Machines

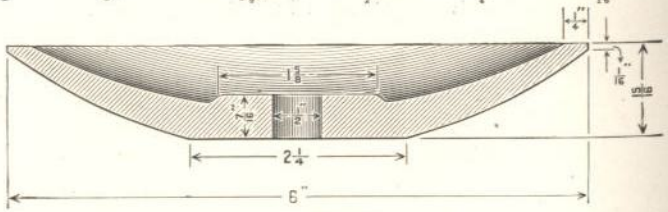
TOOL AND CUTTER GRINDER



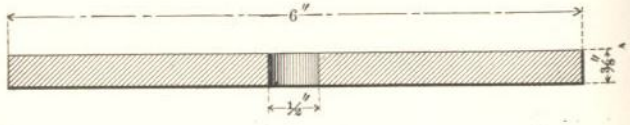
SHAPE NO.	CODE WORD	DIAMETER	HEIGHT	HOLE	THICKNESS OF RIM	THICKNESS OF BACK	LIST PRICE
1	LEACH	5"	1½"	½"	7/16"	7/16"	$3.40



2	LEAFY	3"	1⅜"	½"	¼"	7/16"	1.85



SHAPE NO.	CODE WORD	DIAMETER	OVERALL THICKNESS	HOLE	LIST PRICE
3	LEARN	6"	13/16"	½"	$3.40



4	LEAST	6"	⅜"	½"	2.40
5	LEAVE	3"	3/16"	¼"	.80
6	LEGAL	7/8"	¼"	¼"	.40
7	LEGER	⅜"	¼"	¼"	.40

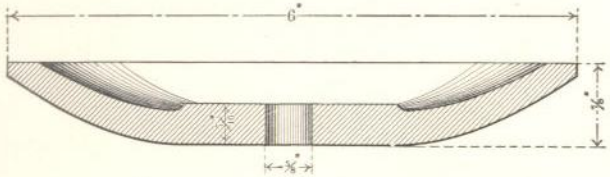
Wheels for OESTERLEIN Grinding Machines

TOOL AND CUTTER GRINDERS

STRAIGHT WHEELS

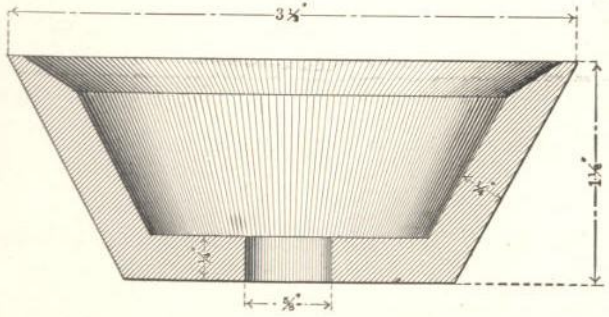
SHAPE NO.	CODE WORD	DIAMETER	THICKNESS	HOLE	LIST PRICE
1	OBLATE	3"	1/8"	½"	$ .80
2	OBLIGE	3/8"	¼"	¼"	.40
5	OBLONG	6"	⅛"	½"	1.90
9	OAKUM	3"	⅛"	5/8"	.80
12	OCULAR	6"	⅛"	5/8"	1.90
15	OLYMPIC	8"	½"	⅝"	3.55

DISH WHEELS



10	OBTUSE	6"	7/8"	5/8"	3.40
3	OBVERT	6"	7/8"	½"	3.40

CUP WHEELS

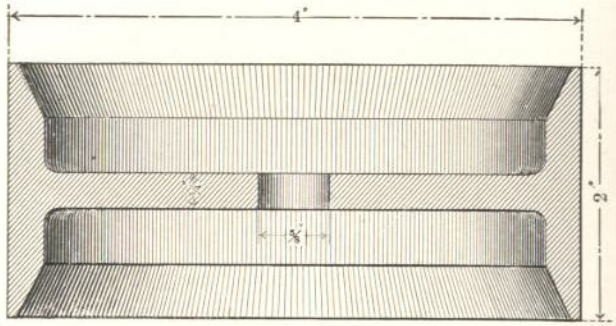


SHAPE NO.	CODE WORD	DIAMETER	HEIGHT	HOLE	THICKNESS OF RIM	THICKNESS OF BACK	LIST PRICE
13	OLIVE	3½"	1½"	⅜"	¼"	¼"	$2.55
4	OCTANT	5"	1½"	½"	5/16"	5/16"	3.40
7	OCOTE	3¼"	1¼"	½"	¼"	¼"	2.25
11	OCTAVE	5"	1¼"	⅜"	5/16"	5/16"	3.80

Wheels for OESTERLEIN Grinding Machines

TOOL AND CUTTER GRINDERS

DOUBLE CUP WHEELS



OESTERLEIN SHAPE No. 14

SHAPE NO.	CODE WORD	DIAMETER	HEIGHT	HOLE	THICKNESS OF RIM	THICKNESS OF BACK	LIST PRICE
8	OMELET	4″	1¼″	⅝″	½″	¼″	$2.80
14	OMEGA	4″	2″	⅝″	½″	¼″	3.10

NOTE:—Numbers, 9, 10, 11, 12, 13, 14 and 15, will be fitted with steel bushings if so ordered. Price of steel bushings 10c. each, net.

Wheels for GOULD & EBERHARDT Grinding Machines

GEAR CUTTER GRINDER

DISH WHEELS

SHAPE NO.	CODE WORD	DIAMETER	OVERALL THICKNESS	HOLE	LIST PRICE
1	GOUGE	8″	1″	1″	$5.20
2	GOUT	12″	1″	4″	9.50

Wheels for INGERSOLL MILLING MACHINE CO. Grinding Machine

		CODE WORD	
CUTTER GRINDER	10″ x ½″ x 1″	INGER	4.90
	Tapered both sides to ¼″ at face (5″ flat spot)		

Wheels for WOODS ENGINEERING CO. Grinding Machines

TOOL AND CUTTER GRINDERS

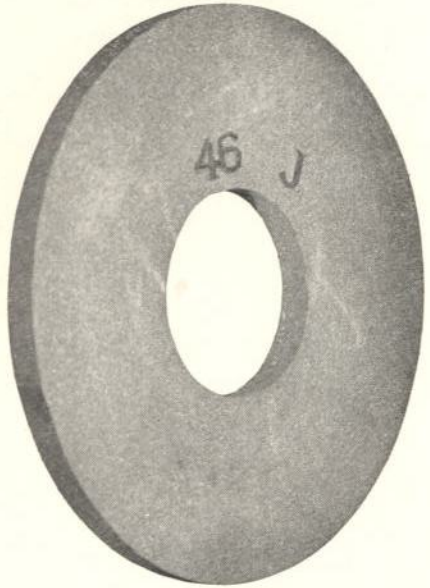
MACHINE NO.	CODE WORD	SHAPE OF WHEEL	DIAMETER	THICKNESS	HOLE	LIST PRICE
1	WOOD	Straight	6″	⅝″	½″	$2.40
1	WORM	Cup	5″	1½″	1″	3.40
1	WORSE	Dish	6″	1½″	½″	2.90
1	WORT	Cup	3″	1¼″	1″	1.65
1	WOULE	Internal	¾″	¼″	¼″	.40
2	WOUND	Straight	8″	⅝″	2″	3.55
2	WOVE	Cup	5½″	1½″	2″	4.45
2	WOSE	Dish	6″	1½″	1″	2.90
2	WOT	Cup	3″	1¼″	1″	1.65
2	WOTH	Internal	¾″	¼″	¼″	.40

American Emery Wheel Works

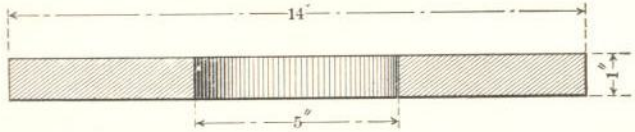
Wheels for NORTON Grinding Machines

STRAIGHT WHEELS

WHEEL FOR



NORTON 6″ PLAIN GRINDER



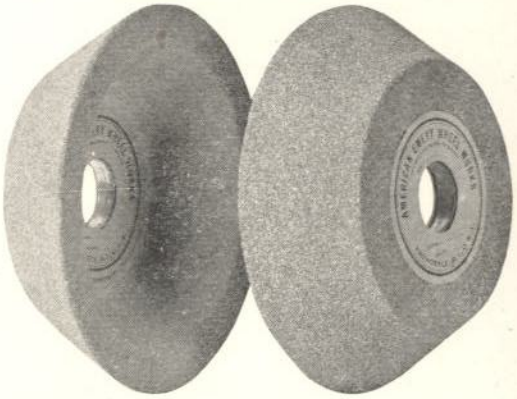
6″ MACHINE, PLAIN GRINDER.		NOBLE	LIST PRICE $11.90
10″ MACHINE, PLAIN GRINDER.	18″x2″x5″	NODDY	LIST PRICE $32.50
14″ MACHINE, PLAIN GRINDER.	20″x2″x5″	NOOSE	LIST PRICE $39.60
18″ MACHINE, PLAIN GRINDER.	24″x2″x5″	NORTH	LIST PRICE $59.00
6″ MACHINE PLAIN GRINDER	14″ x 2″ x 5″	NOB	LIST PRICE $21.20
10″ MACHINE PLAIN GRINDER	18″ x 1″ x 5″	NOCENT	LIST PRICE $17.70

WHEEL SHAPE NO.	CODE WORD	DIAMETER	THICKNESS	HOLE	
8	NOCK	5″	¼″	1¼″	LIST PRICE $1.50
12	NODAL	7″	1/16″	1¼″	" " 2.30
14–Coarse	NODOSE	6″	1/16″	1¼″	" " 2.40
31–Fine	NOIL	6″	⅛″	1½″	" " 2.40
42	NOISE	5″	¼″	1¼″	" " 1.50
45	NOMA	7″	1/16″	1¼″	" " 2.30
46–Coarse	NOMAD	8″	1/16″	1½″	" " 3.55
49–Fine	NOME	8″	⅛″	1½″	" " 3.55

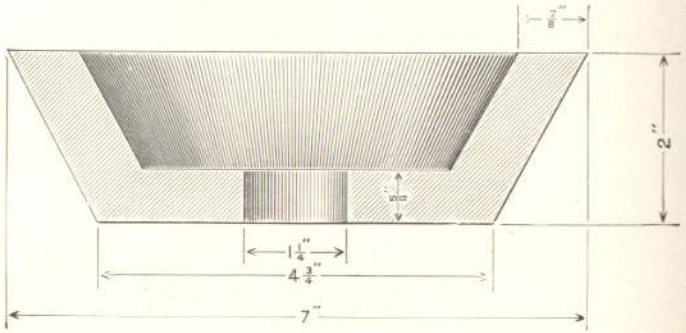
Wheels for NORTON Grinding Machines

CUP WHEELS

NORTON



SHAPE No. 15



SHAPE NO.	CODE WORD	DIAMETER	HEIGHT	HOLE	THICKNESS OF RIM	THICKNESS OF BACK	LIST PRICE
15	NONAGE	7″	2″	1¼″	⅞″	⅝″	$6.90
28Coarse	NONDO	4″	1⅝″	1¼″	¼″	½″	2.55
29Fine	NONNAT	4″	1⅝″	1¼″	¼″	½″	2.55
47	NOOK	7″	2″	1½″	⅞″	⅝″	6.90
50Coarse	NORM	4½″	2″	1½″	¼″	½″	4.15
51Fine	NORMAN	4½″	2″	1½″	¼″	½″	4.15

DISH WHEELS

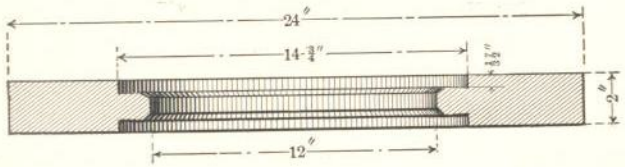
		DIAMETER	OVERALL THICKNESS	HOLE	
1	NORSE	3″	7/16″	½″	1.00
2	NOSTRIL	3½″	1/2″	½″	1.40
3	NOTAL	4½″	19/32″	½″	1.90
10Coarse	NOTOUR	6″	½″	1¼″	2.40
30Fine	NOVA	6″	½″	1¼″	2.40
43Coarse	NOVEL	6″	½″	1½″	2.40
52Fine	NOVICE	6″	11/16″	1½″	2.90

Wheels for NORTON Grinding Machines

INTERNAL WHEELS

SHAPE NO.	DIAMETER	THICKNESS	HOLE	RECESSED ONE SIDE	LIST PRICE
22	⅜″	¼″	⅛″	¼″ x 3/32″	$ .40
23	7/16″	¼″	⅛″	¼″ x 3/32″	.40
24	9/16″	¼″	⅛″	¼″ x 3/32″	.40
25	11/16″	¼″	⅛″	¼″ x 3/32″	.40
26	⅞″	¼″	⅛″	¼″ x 3/32″	.40
27	15/16″	¼″	¼″	3/32″ x 3/32″	.50
33	15/16″	⅜″	¼″	3/32″ x 3/32″	.50
34	15/16″	⅜″	¼″	3/32″ x 3/32″	.50
35	1 1/16″	⅜″	¼″	3/32″ x 3/32″	.75
36	1 1/16″	⅜″	¼″	3/32″ x 3/32″	.75
37	1 1/16″	⅜″	¼″	3/32″ x 3/32″	.75
38	1 1/16″	⅜″	¼″	3/32″ x 3/32″	.75
39	⅞″	⅜″	5/16″	3/32″ x 3/32″	.50
54	1″	⅜″	5/16″	3/32″ x 3/32″	.50
55	1¼″	⅜″	5/16″	3/32″ x 3/32″	.75
56	1½″	⅜″	5/16″	3/32″ x 3/32″	.75
57	1¾″	⅜″	5/16″	3/32″ x 3/32″	.75
58	2″	⅜″	5/16″	3/32″ x 3/32″	.75

RECESSED WHEELS



SHAPE 73.
CRANKSHAFT GRINDER.

NOTCH

LIST PRICE $53.45

NOTE:—We are prepared to manufacture any other types of Norton Crankshaft Grinding Wheels or to quote prices upon receipt of specifications.

Wheels for FRASER UNIVERSAL Grinding Machines

No. 1 Grinder takes wheels 8″ in diameter, 1″ hole, and any thickness not greater than ½″

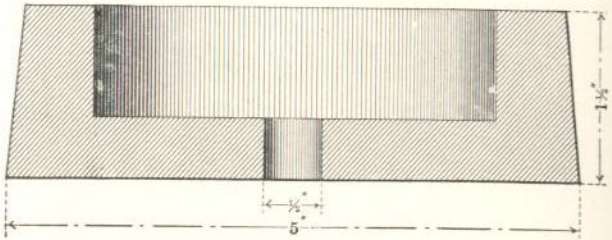
No. 2 2-A, 3, 3-A, 2-C, 2-AC, 3-C, 3-AC machines, take wheels 10″ in diameter, 3″ hole, any thickness up to 1½″.

No. 21 Grinder takes wheel 12″ in diameter, 3″ hole, any thickness up to 1½″.

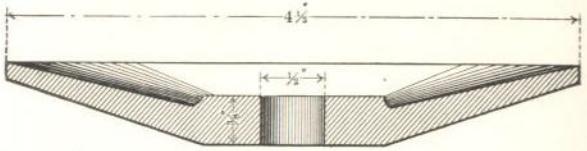
Above Wheels take Straight Wheel List Prices as shown on page 37.

Wheels for GREENFIELD Grinding Machines

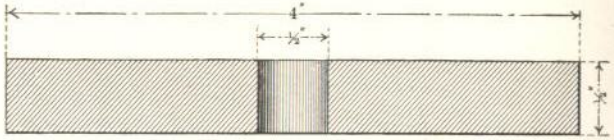
TOOL AND CUTTER GRINDERS



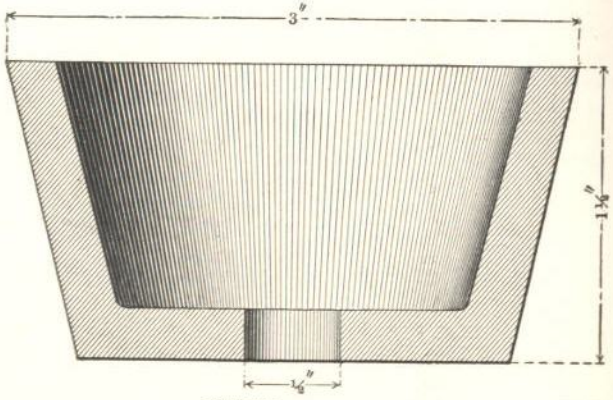
SHAPE 1. GRACE. LIST PRICE $3.40



SHAPE 2. GRAPHIC. LIST PRICE $1.90



SHAPE 3. GRASP. LIST PRICE $1.40



SHAPE 4. GRAPPLE LIST PRICE $1.85

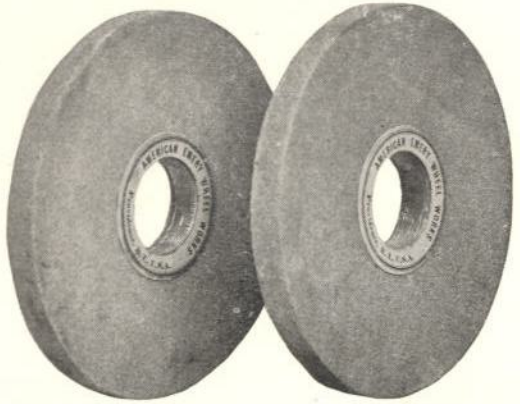
SHAPE 5, INTERNAL WHEEL GRASSY ¾" x ¼" x ¼" LIST PRICE .40

American Emery Wheel Works

Wheels fo. MODERN TOOL CO. Grinding Machines

UNIVERSAL GRINDERS, Nos. 1, 2, 3, 12, 14, 16 & 18

WHEELS FOR



MODERN GRINDER

STRAIGHT WHEELS

MACHINE NO. 1.	8" x ¾" x 2"	MODAL	LIST PRICE $ 4.40
MACHINE NO. 1.	8" x ½" x 2"	MODE.	LIST PRICE $ 3.55
MACHINE NO. 1.	6" x ½" x 1½"	MODENT.	LIST PRICE $ 2.40
MACHINE NO. 2.	10" x 1" x 3"	MODIFY.	LIST PRICE $ 7.50
MACHINE NO. 2.	10" x ½" x 3"	MODISH.	LIST PRICE $ 4.90
MACHINE NO. 2.	7" x ½" x 2"	MODULE.	LIST PRICE $ 2.95
MACHINE NO. 3.	14" x 1¼" x 5"	MOHAIR.	LIST PRICE $14.20
MACHINE NO. 3.	8" x ½" x 2"	MOIETY.	LIST PRICE $ 3.55
MACHINE NO. 12.	12" x 1¼" x 5"	MOIL.	LIST PRICE $11.30
MACHINE NO. 14.	18" x 2" x 5"	MOIST.	LIST PRICE $32.50
MACHINE NO. 16 & 18.	20" x 2" x 5"	MOLAR.	LIST PRICE $39.60
MACHINE NO. 1, 2 & 3.	3" x ⅜" x ¾"	MOLE.	LIST PRICE $ 1.00
MACHINE NO. 1, 2 & 3.	2¾" x ⅜" x ¾"	MOLEST.	LIST PRICE $ 1.00
MACHINE NO. 1, 2 & 3.	2½" x ⅜" x ¾"	MOLTEN.	LIST PRICE $ 1.00
MACHINE NO. 1, 2 & 3.	2¼" x ⅜" x ¾"	MONAD.	LIST PRICE $ 1.00
MACHINE NO. 1, 2 & 3.	2" x ⅜" x ¾"	MONK.	LIST PRICE 75c.
MACHINE NO. 1, 2 & 3.	1¾" x ¼" x ¼"	MONKEY.	LIST PRICE 60c.
MACHINE NO. 1, 2 & 3.	1½" x ¼" x ¼"	MONODY.	LIST PRICE 60c.
MACHINE NO. 1, 2 & 3.	1¼" x ¼" x ¼"	MONSTER.	LIST PRICE 60c.
MACHINE NO. 1, 2 & 3.	1⅛" x ¼" x ¼"	MOOD.	LIST PRICE 60c.
MACHINE NO. 1, 2 & 3.	1" x ¼" x ¼"	MOODY.	LIST PRICE 40c.
MACHINE NO. 1, 2 & 3.	⅞" x ¼" x ¼"	MOON.	LIST PRICE 40c.
MACHINE NO. 1, 2 & 3.	¾" x ¼" x ¼"	MOOR.	LIST PRICE 40c.
MACHINE NO. 1, 2 & 3.	½" x ¼" x ¼"	MOORY.	LIST PRICE 40c.
MACHINE NO. 1, 2 & 3.	⅜" x ¼" x ⅛"	MOOSE.	LIST PRICE 40c.
MACHINE NO. 1, 2 & 3.	¼" x ¼" x ⅛"	MOPE.	LIST PRICE 40c.

Wheels for MODERN TOOL CO. Grinding Machines

12″ SWING PLAIN S. C. GRINDER

CODE WORD	DIAMETER	THICKNESS	HOLE	RECESSED ONE SIDE	LIST PRICE
MODEL	20″	2″	5″		$39.60
MODERN	20″	2½″	5″	8″ x ½″	48.70
MODEST	20″	2¾″	5″	8″ x ¾″	53.35
MODOC	20″	3″	5″	8″ x 1″	58.00
MODUS	20″	3½″	5″	8″ x 1½″	67.00
MOFF	20″	4″	5″	8″ x 2″	76.00

PLAIN S. C. GRINDER

MOKE	16″	1″	5″		14.60
MOGUL	16″	1½″	5″		20.50
MOHAWK	16″	2″	5″	7¾″ x ½″	26.50
MOHO	16″	2⅜″	5″	7¾″ x ⅜″	32.40
MOLD	16″	2½″	5″	7¾″ x 1″	32.40

CHASER GRINDER

MOLL	⅜″	¼″	¼″		.40
MOLOCH	1¾″	¼″	¼″		.60
MOMENT	1½″	¼″	¼″		.60
MONUS	¾″	¼″	¼″		.40
MONEY	1⅛″	¼″	¼″		.60
MONGER	1¼″	¼″	¼″		.60
MONGOL	1⅜″	¼″	¼″		.60
MONOID	1″	¼″	¼″		.40
MONOX	2¼″	¼″	⅜″		.80
MONSOON	2″	¼″	⅜″		.60
MONTE	3″	¼″	⅜″		.80
MONTH	2¾″	¼″	⅜″		.80
MONTRE	2½″	¼″	⅜″		.80
MOPPET	3¼″	¼″	⅜″		1.10
MORA	5″	⅜″	½″		1.90

INTERNAL GRINDING FIXTURES

MORAL	2″	½″	⅝″		.75
MORASS	1¼″	⅜″	⅝″		.75
MORBID	1½″	⅜″	⅝″		.75
MORDANT	1¾″	½″	⅝″		1.00
MOREEN	2¼″	½″	⅝″		1.00
MORGUE	2½″	½″	⅝″		

NOTE.—Other sizes of Internal Wheels listed under Universal Grinder Shapes.

Wheels for FITCHBURG Grinding Machines

STRAIGHT WHEELS

FITCHBURG

SHAPE No. 47

SHAPE NO.	CODE WORD	DIAMETER	THICKNESS	HOLE	LIST PRICE
47	FITCH	16″	1″	5″	$14.60

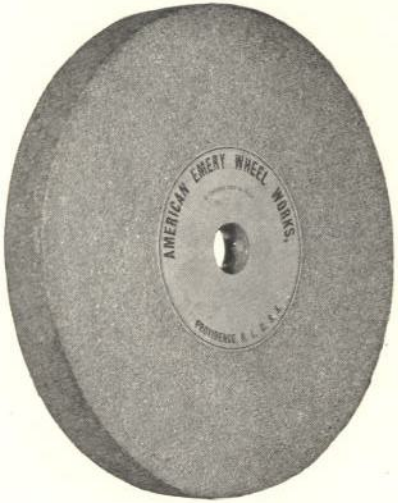
RECESSED WHEELS

SHAPE NO.	CODE WORD	DIAMETER	THICKNESS	HOLE	RECESSED BOTH SIDES	LIST PRICE
39	FITNESS	16″	2″	5″	7¾″ x 7/16″	$26.50
43	FITZ	16″	3″	5″	7¾″ x 9/16″ / 7¾″ x 11/16″	38.30
46	FIXATE	16″	4″	5″	7¾″ x 9/16″ / 7¾″ x 1 13/16″	50.20
48	FITTER	16″	6″	5″	7¾″ x 1½″	75.30
49	FIX	16″	8″	5″	7¾″ x 1½″ / 7¾″ x 3½″	100.40

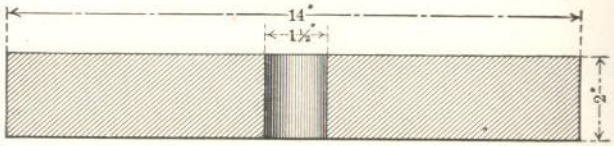
Wheels for DIAMOND Grinding Machines

STRAIGHT WHEELS

DIAMOND



SHAPE No. 1

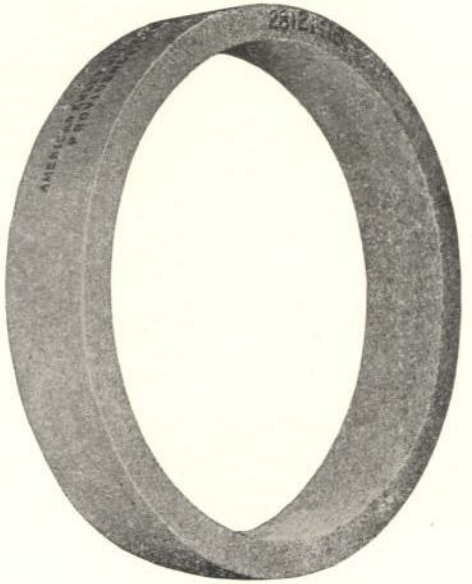


MACHINE	CODE WORD	DIAMETER	THICKNESS	HOLE	LIST PRICE
No. 1 Wet Tool Grinder	DIFFER	14″	2″	1½″	$21.20
No. 2 " " "	DIGEST	20″	2½″	7″	48.70
No. 3 " " "	DIGIT	24″	3½″	10″	99.00
No. 4 " " "	DIMITY	30″	4″	16″	157.25
No. 5 " " "	DIMPLE	36″	4″	21″	217.65
Automatic Surface Grinder	DINT	12″	1½″	1½″	13.10
Surface Grinder	DIODON	10″	1″	⅝″	7.50
Roll Grinder	DION	26″	1½″	1¼″	52.50
Automatic Knife Grinder	DIOTA	26″	1½″	1¼″	52.50
Gorton Grinder	DITTY	14″	2½″	8″	25.80

Wheels for DIAMOND Grinding Machines

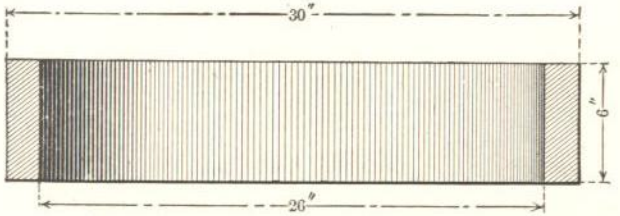
CYLINDER WHEELS

WHEEL FOR



84″ GUIDE BAR GRINDER

(Drawing Below)



MACHINE	CODE WORD	DIAMETER	HEIGHT	HOLE	THICKNESS OF RIM	LIST PRICE
84″ Guide Bar Grinder	DISTANT	30″	6″	26″	2″	$161.50
Face and Angle Grinder	DINNER	12″	3″	10″	1″	23.80
Knife or Face Grinder	DISCERN	14″	3½″	12″	1″	27.75
Car Box Grinder	DISDAIN	22″	4½″	19½″	1¼″	79.35
Automatic Knife Grinder (For Long Knives)	DISEME	18″	4″	15″	1½″	45.00

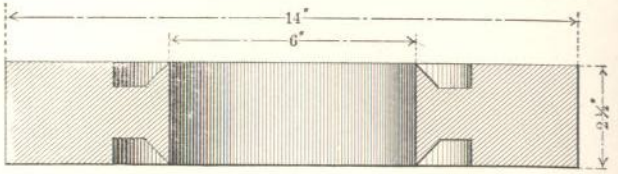
Wheels for OTT Grinding Machines

MACHINE	CODE WORD	DIAMETER	THICKNESS	HOLE	LIST PRICE
Plain Grinder	OTT	10″	1¼″	3″	$8.90
Universal Grinder	OTTER	12″	1½″	5″	13.10
Universal Grinder	OUCH	7″	¾″	2″	3.60

6″ x 6″ Internal Grinder.—Variety of Wheels from ¼″ to 3″ in Diameter.

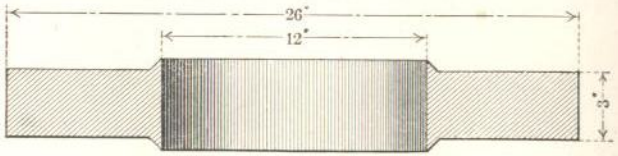
Wheels for SPRINGFIELD Grinding Machines

DOVETAIL WHEELS



MACHINE NO.	CODE WORD	DIAMETER	THICKNESS	HOLE	LIST PRICE
O Tool Grinder	SPACE	14″	2½″	6″	$25.80
1–A Tool Grinder	SPADE	20″	3″	9″	58.00
2 Tool Grinder	SPARE	26″	4″	12″	122.70
4 and 4½ Tool Grinder	SPEAK	30″	4″	14″	160.75

RAISED DOVETAIL WHEELS

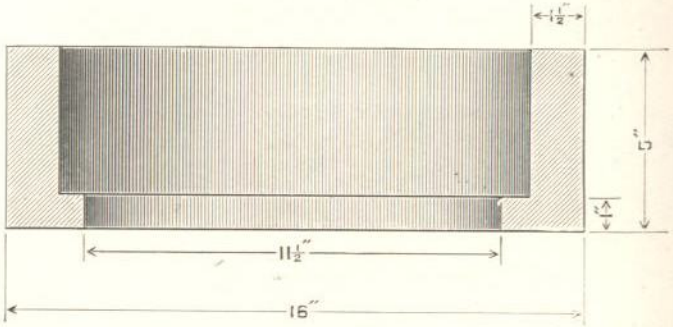


MACHINE NO.	CODE WORD	DIAMETER	THICKNESS	HOLE	LIST PRICE
2, 2½ and 7 Tool Grinder	SPARK	26″	3″	12″	$93.05
5 and 8 Tool Grinder	SPECIE	36″	4″	24″	205.35
Knife Grinder	SPINE	26″	1½″	12″	48.15

STRAIGHT WHEELS

1, 1½ and 3 Tool Grinder	SPASM	20″	3″	9″	58.00
2–A Tool Grinder	SPAWN	26″	4″	12″	122.70
6 Tool Grinder	SPEECH	36″	4″	24″	205.35

CUP WHEELS



MACHINE	CODE WORD	DIAMETER	HEIGHT	HOLE	THICKNESS OF RIM	THICKNESS OF BACK	LIST PRICE
Springfield Brandes	SPEED	16″	5″	11¼″	1½″	1″	$51.25
Guide Bar Grinder	SPELL	30″	8″	23″	2″	1″	237.25

Wheels for BRIDGEPORT Grinding Machines

STRAIGHT WHEELS

MACHINE	CODE WORD	DIAMETER	THICKNESS	HOLE	LIST PRICE
No. 3 Tool	BRIBE	20″	2½″	9″	$48.70
No. 4 "	BRICK	26″	3″	12″	93.05
No. 5 "	BRICOLE	36″	4″	24″	205.35
No. 6 "	BRIDOON	42″	4″	26″	286.65
Heavy Knife	BRIG	36″	2″	24″	104.35

CUP WHEELS

		DIAMETER	HEIGHT	HOLE	THICKNESS OF RIM	THICKNESS OF BACK	
Medium Weight Knife	BRIGHT	20″	8″	4″	2″	1¼″	119.10
Medium Weight Knife	BRIGIT	20″	8″	13½″	2″	1¼″	119.10
Heavy Cup Wheel Knife	BRILL	24″	8″	3″	2″	1¼″	166.55
Heavy Cup Wheel Knife	BRIM	24″	8″	17″	2″	1¼″	166.55
Guide Bar (old style)	BRINGE	30″	8″	3″	2″	1⅜″	249.70
Guide Bar (new style)	BRINK	30″	8″	6″	2″	1⅜″	249.70
Combination	BRINY	12″	6″	7″	1½″	1¼″	35.85
No. 7 Combination	BRISURE	16″	5″	1½″	2″	1″	51.45

DOVETAIL WHEELS

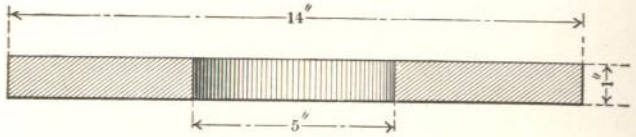
		DIAMETER	THICKNESS	HOLE	
No. 3 Tool	BRITT	20″	2½″	7″	48.70
No. 5 Tool	BRIZA	36″	4″	24″	205.35
Medium Weight Knife	BRINCH	26″	1½″	12″	48.15
Heavy Knife	BRIGOSE	36″	2″	24″	104.35

Wheels for MORSE Grinding Machines

MACHINE	CODE WORD	DIAMETER	THICKNESS	HOLE	LIST PRICE
No. 1 Plain	MORAL	10″	¾″	4″	$6.20
No. 2 "	MORASS	14″	1″	5″	11.90
No. 3 "	MORAY	16″	2¼″	5″	29.45
No. 1 Universal	MOREEN	10″	¾″	4″	6.20
No. 1 "	MORN	6″	⅜″	2″	2.40
No. 2 "	MOROSE	12″	1″	5″	9.50
No. 2 "	MORRIS	7″	⅜″	2″	2.95

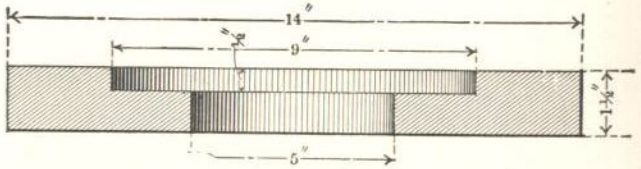
Wheels for CINCINNATI GRINDER CO. Grinding Machines

STRAIGHT WHEELS



SHAPE NO.	CODE WORD	DIAMETER	THICKNESS	HOLE	LIST PRICE
2	COAL	As above			$11.90
3	COALY	1¼"	⅛"	⅜"	.75
4	COAST	2"	⅛"	⅜"	.75
6	COAT	3"	⅛"	1"	1.00
7	COAX	2"	⅛"	1"	.75
8	COB	2½"	⅛"	1"	1.00
9	COBALT	⅞"	¼"	¼"	.40
10	COBBLE	⅝"	¼"	3/32"	.40
11	COBWEB	⅜"	¼"	5/32"	.40
12	COCK	1½"	⅛"	⅝"	.75
13	COCOA	18"	2"	5"	32.50
14	CODGER	4"	⅛"	1"	1.40
15	CODIFY	14"	2"	5"	21.20

RECESSED WHEELS
(One Side)



		DIAMETER	THICKNESS	HOLE	SIZE OF RECESS	
1	COACH	As above				16.50
16	CODILLE	18"	2½"	5"	10¾" x ½"	39.80
17	CODLING	18"	3"	5"	10¾" x 1"	47.20
18	COELE	14"	4"	5"	9" x 2"	39.80
19	COERCE	14"	3"	5	9" x 1"	30.50
20	COFFEE	14"	2½"	5"	9" x ½"	25.80
21	COFFIN	18"	4"	5"	10¾" x 2"	62.00

RECESSED WHEELS (Both Sides) FOR CRANKSHAFT GRINDING

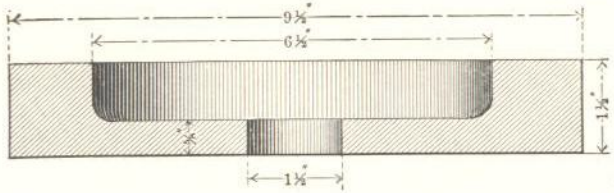
22	COG	22"	2"	12"	14⅜" x 7/16"	42.15

NOTE.— We are prepared to manufacture any other types of Cincinnati Crankshaft Grinding Wheels or to quote prices upon receipt of specifications.

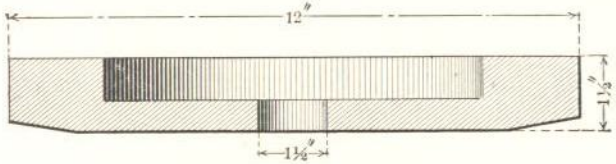
American Emery Wheel Works

Wheels for WILMARTH & MORMON Grinding Machines

DRILL GRINDERS

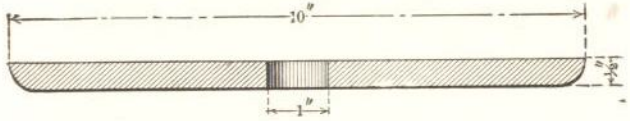


SHAPE	CODE WORD	DIAMETER	THICKNESS	HOLE	RECESSED ONE SIDE	LIST PRICE
Yankee Style A	YACHT	(As Above)			6½" x ⅜"	$10.20
" " H	YAWL	5"	1"	1 1/16"	3" x ½"	2.65
" " J	YAWN	7"	1"	1 1/16"	4½" x ½"	4.30
" " B	YAWS	10"	3"	1"	8" x 1¾"	18.00
" " F.O.	YEAN	12"	3"	1"	9" x 1¾"	23.80



Yankee Style F	YARROW	(As Above)			8" x ⅞"	13.10
" " G	YEARN	20"	2¾"	2"	14" x 1"	53.35
" " WFL	YEAST	12"	1¼"	1½"	10" x ½"	11.30

POINT THINNING WHEELS



SHAPE	CODE WORD	DIAMETER	THICKNESS	HOLE	
Yankee Style A	YARD	10"	½"	1"	4.90
" " F	YAUP	12"	⅝"	1"	7.80
" " H	YEOMAN	5"	¼"	1 1/16"	1.50
" " J	YESTER	7"	⅜"	1 1/16"	2.95

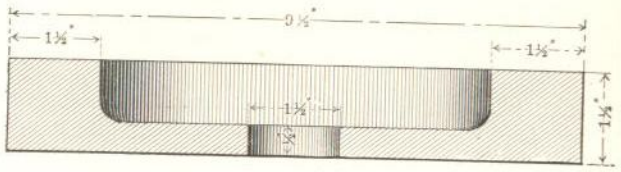
SURFACE GRINDING WHEELS

MACHINE					
No. 1	YELL	8"	½"	1¼"	3.55
Nos. 1 and 2	YELLOW	10"	1"	1¼"	7.50
No. 3	YERBA	12"	1"	1¼"	9.50
No. 78	YEW	10"	¾"	1¼"	6.20

Wheels for WORCESTER Grinding Machines

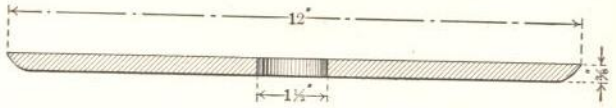
Manufactured by Washburn Shops

DRILL GRINDERS



SHAPE	CODE WORD	DIAMETER	THICKNESS	HOLE	RECESSED ONE SIDE	LIST PRICE
No. 1 and No. O	WOOER	9½"	1⅝"	1½"	6½" x 1"	$10.20
No. 00 (Wet)	WOFUL	15⅝"	3"	1"	8⅛" x 1⅜"	38.30
No. 1 (Wet)	WOOF	12¾"	2¼"	⅞"	9½" x 1⅝"	23.50
No. 2	WORSHIP	6"	1¼"	1⅛"	3¾" x ¾"	3.90
No. 3	WOUND	4"	13/16"	½"	2½" x 5/16"	1.95

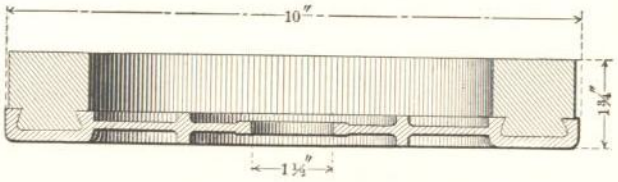
POINT THINNING WHEELS



SHAPE	CODE WORD	DIAMETER	THICKNESS	HOLE	LIST PRICE
No. 00 (Wet)	WOODY		(As Above Drawing)		6.00
No. 1 and No. 0	WOOLLY	8"	5/16"	1½"	3.55
No. 2	WORTHY	6"	¼"	1⅛"	1.90
No. 3	WOVEN	3⅜"	⅛"	1¼"	1.10

DRILL GRINDER

(with Iron Back)



NO. 1 AND NO. 0 — WOOLEN — LIST PRICE $11.50

IRON BACK FOR ABOVE — NET PRICE $ 3.25

Wheels for GARVIN Grinding Machines

STRAIGHT WHEELS

FOR MACHINE	CODE WORD	DIAMETER	THICKNESS	HOLE	LIST PRICE
No. 1 Cutter Grinder	GATER	2½"	½"	½"	$1.00
No. 3 Cutter Grinder	GARTH	2"	¼"	½"	.60
No. 3 Cutter Grinder	GARROT	2"	⅛"	½" (Bevel Face)	.75
Surface Grinder	GARNISH	6"	⅜"	½"	2.40
No. 2 Hole Grinder	GARNET	1"	⅛"	⅜"	.50

DISH WHEEL

No. 3 Cutter	GARLIC	6"		5/16"	¾"		2.90

CUP WHEEL

		DIAMETER	HEIGHT	HOLE	RIM	BACK	
No. 3 Cutter	GARISH	3"	1¼"	½"	¼"	⅜"	1.65

Wheels for UNION TWIST DRILL CO. Grinding Machines

DISH WHEELS

FOR MACHINE	CODE WORD	DIAMETER	OVERALL THICKNESS	HOLE	LIST PRICE
Hob Grinder	UNION	8"	¾"	¾"	$4.40
No. 1 Formed Cutter	UNIT	5"	⅜"	½"	2.25
No. 2 and 3 Formed Cutter	UNISON	6"	13/16"	¾"	3.40

CUP WHEELS

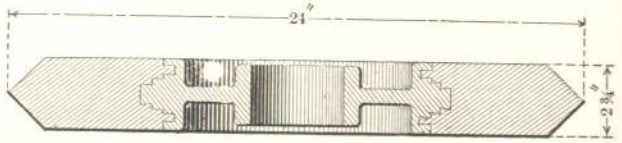
		DIAMETER	HEIGHT	HOLE	RIM	BACK	
No. 1 Cutter and Reamer	UNITY	2½"	1¼"	½"	¼"	¼"	1.65

Wheels for BAXTER D. WHITNEY Grinding Machines

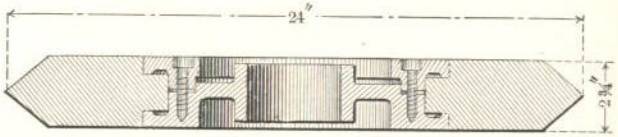
For No. 23 Cylinder Grinder

CODE WORD	DIAMETER	THICKNESS	HOLE	RECESSED ONE SIDE	LIST PRICE
WHITE	4"	¾"	¾"	1¾" x 5/16"	$1.65
WHIZ	3½"	¾"	¾"	1¾" x 5/16"	1.65

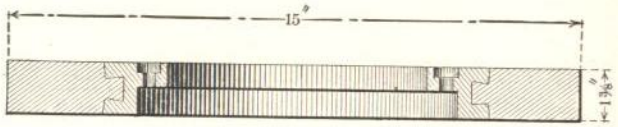
Wheels for SELLERS Grinding Machines



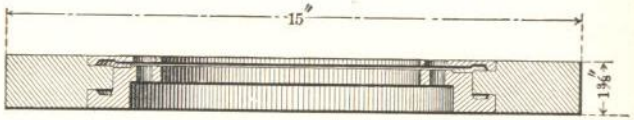
NO. 1 TOOL GRINDER — SENDER — LIST PRICE $78.00



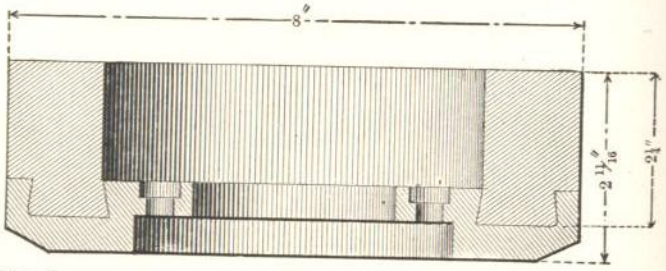
NO. 1 TOOL GRINDER. — SENILE — LIST PRICE $78.00



NO. 2 TOOL GRINDER — SENNA — LIST PRICE $20.50



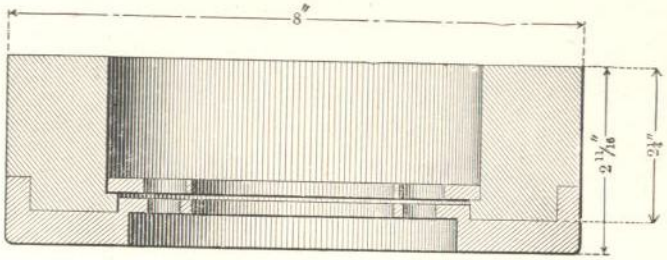
NO. 2 TOOL GRINDER — SENSE — LIST PRICE $20.50



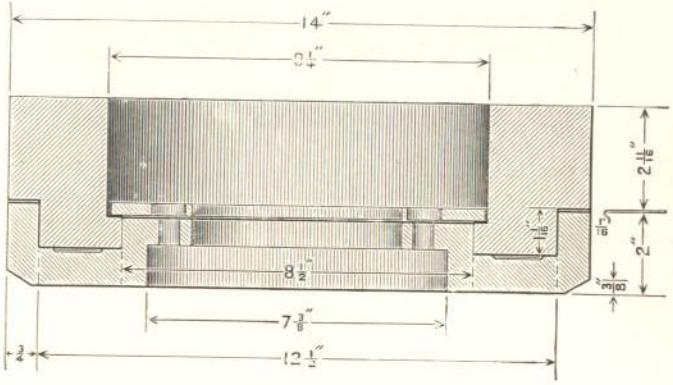
NO. 2 DRILL GRINDER — SERAPH — LIST PRICE $9.45

American Emery Wheel Works

Wheels for SELLERS Grinding Machines



NO. 2 DRILL GRINDER. — SERENE — LIST PRICE $9.45



NO. 1 DRILL GRINDER — SERF — LIST PRICE $37.45

IRON BACKS AND CENTERS

We furnish Iron Backs and Centers for all Sellers Wheels. Owing to the fluctuations in cost of these attachments prices are not shown, but will be gladly furnished upon application.

Wheels for PERSONS-ARTER Grinding Machines

8" and 12" ROTARY SURFACE GRINDER

CODE WORD	DIAMETER	THICKNESS	HOLE	LIST PRICE
PERSON	12"	1"	5"	$9.50
PERSUADE	12"	¾"	5"	7.80
PERTHITE	12"	1¼"	5"	11.30

16" ROTARY SURFACE GRINDER

PERTURB	14"	1¼"	5"	14.20
PERU	14"	1"	5"	11.90
PERUKE	14"	1½"	5"	16.50

Wheels for WELLS Cutter and Reamer Grinding Machines

CUP WHEEL

SHAPE NO.	CODE WORD	DIAMETER	HEIGHT	HOLE	RIM THICKNESS	BACK THICKNESS	LIST PRICE
9	WEAVER	4½″	1½″	½″	½″	½″	$3.40

DISH WHEEL

		DIAMETER	OVERALL THICKNESS	HOLE	
13	WEASEL	4½″	⅜″	½″	1.90

STRAIGHT WHEELS

14	WEEPERS	4½″	½″	½″	1.90
15	WEDGED	4½″	¼″	½″ No. 3 Face	1.50
16	WOLFISH	4½″	⅜″	½″	1.90
17	WOOED	1″	¼″	⅛″	.40
18	WORKBOX	¾″	¼″	⅛″	.40
19	WREATH	⅝″	1/16″	⅛″	.40
20	WRESTLE	½″	1/16″	¼″	.40
21	WRIGGLE	⅜″	1/16″	⅛″	.40

Wheels for BRYANT CHUCKING Grinding Machines

CUP WHEELS

SHAPE NO.	CODE WORD	DIAMETER	HEIGHT	HOLE	RIM THICKNESS	BACK THICKNESS	LIST PRICE
42	BRUIN	3″	1⅛″	⅞″	¼″	½″	$1.65
58	BRUNT	4″	2″	1⅜″	⅜″	7/16″	3.10

NOTE.— We manufacture and stock all sizes of wheels for Bryant Internal Grinding Machines.

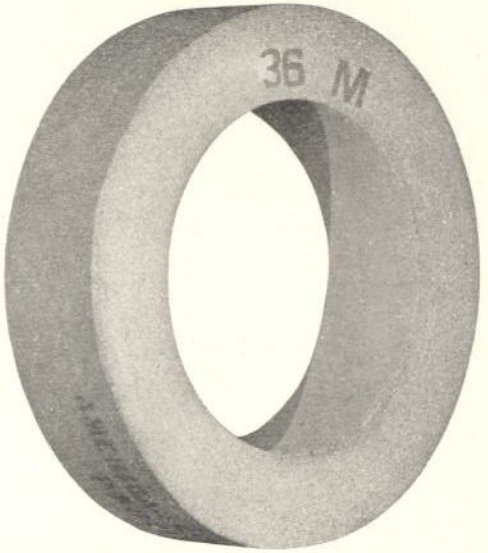
Wheels for GOODELL-PRATT Grinding Machines

FOR MACHINE NO.	CODE WORD	DIAMETER	THICKNESS	HOLE	LIST PRICE
25½	GOOD	4″	½″	½″	$1.40
109–115 142–143	GOOSE	4″	1″	½″	1.95
144–485	GOPHER	5″	1″	½″	2.65
149	GORE	7″	1¼″	½″	4.95
118-119	GORGE	8″	¾″	½″	4.40

Wheel for BAIRD Tool and Die Grinding Machine

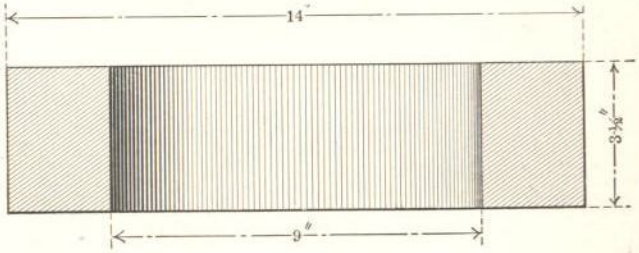
BAIRD	10″	¾″	¾″	6.20

Wheels for DISC Grinding Machines



DISC GRINDING WHEEL

(Drawing Below)



For BADGER TOOL CO. Grinders

SHAPE NO.	CODE WORD	DIAMETER	HEIGHT	HOLE	RIM OR FACE THICKNESS	LIST PRICE
1	BIGOT	8″	3″	4″	2″	$12.00
2	BIKE	10″	3″	6″	2″	18.00
3	BILE	12″	3″	8″	2″	23.80
4	BILGE	14″	3½″	9″	2½″	35.10
5	BIPED	16″	4″	10″	3″	41.25
6	BIRD	18″	4½″	12″	3″	62.10
7	BISON	20″	5½″	14″	3″	85.45
8	BITE	24″	6½″	18″	3″	136.50
9	BITTER	30″	6½″	22″	4″	212.35

For ROWBOTTOM MACHINE CO. Grinders

	DIAMETER	THICKNESS	HOLE	
ROWDY	10″	1¼″	3″ to 2½″ Tapered	8.90
ROWEL	10″	1¼″	¾″	8.90

Wheels for DISC Grinding Machines

For CHAS. H. BESLEY & CO. Grinders

CYLINDER WHEELS

SHAPE NO.	CODE WORD	DIAMETER	HEIGHT	HOLE	RIM OR FACE THICKNESS	LIST PRICE
1	BEADLE	10″	2½″	8″	1″	$15.40
2	BEADY	12″	3″	7″	2½″	23.80
5	BEAGLE	14″	4″	9″	2½″	32.20
6	BEAK	15″	4″	9″	3″	41.25
7	BEAM	16″	4″	10″	3″	41.25
8	BEARD	18″	4″	12″	3″	51.30

WIDE FACE RING WHEELS

9	BEAST	18″	3″	6″		47.20
10	BEAU	24″	3″	8″		85.00
11	BEAVER	30″	3″	10″		132.00

For GARDNER MACHINE CO. Grinders

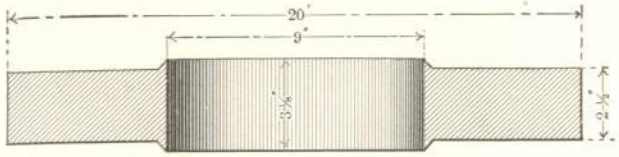
CYLINDER WHEELS

1	GARB	12″	3″	8″	2″	23.80
2	GARBLE	14″	3½″	9″	2½″	35.10
3	GARDEN	16″	4″	10″	3″	41.25
4	GARRET	18″	4¾″	11″	3½″	64.00
5	GARTER	20″	5¼″	12″	4″	91.30
6	GARNER	8″	2½″	6″	½″	10.30
7	GARGLE	10″	3″	7″	1½″	18.00
8	GARLAND	24″	6½″	14″	5″	162.10

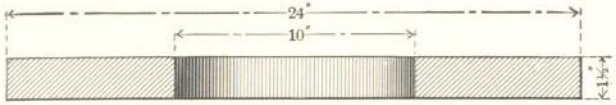
REEVES ROLL GRINDER WHEELS

9	GARMENT	16″	5″	5″		62.75
10	GARROTE	18″	4″	8″		62.00

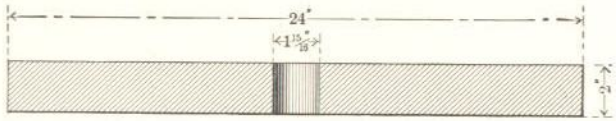
Wheels for WET TOOL Grinding Machines



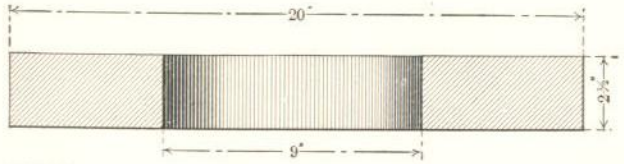
WHITNEY TOOL GRINDER. (THE TAYLOR & FENN CO.) — WHIST. — LIST PRICE $48.70



LELAND & FAULCONER TOOL GRINDER. (MORSE TWIST DRILL & MCH. CO.) — LEOPARD. — LIST PRICE $44.00

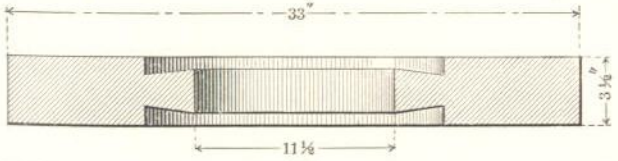


W. F. & JOHN BARNES TOOL GRINDER. — BABBLE. — LIST PRICE $59.00



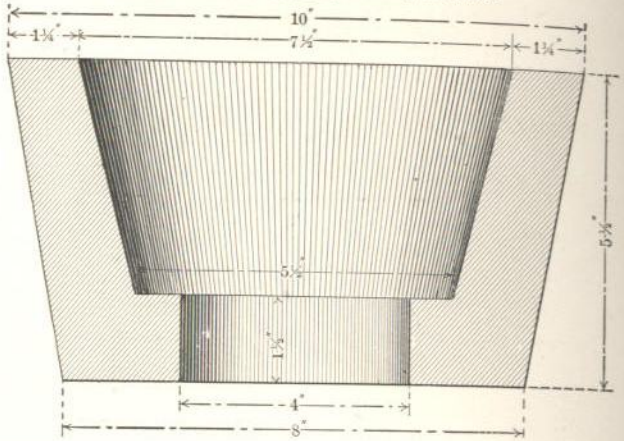
BLOUNT TOOL GRINDER. — BLITHE. — LIST PRICE $48.70

BLOUNT TOOL GRINDER 14″ x 1⅛″ x 4″ — BLISS. — LIST PRICE $ 16.50
BLOUNT TOOL GRINDER 30″ x 3″ x 16″ — BLINK. — LIST PRICE $119.25

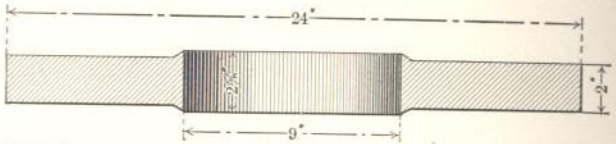


TAYLOR TOOL GRINDER (TABOR MFG. CO.) — TALENT — LIST PRICE $191.00

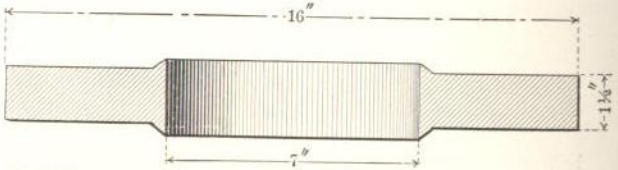
Wheels for **WET TOOL** Grinding Machines



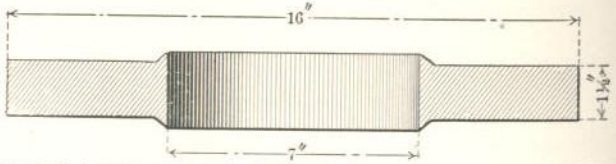
GISHOLT TOOL GRINDER. GIRDLE. LIST PRICE $29.55



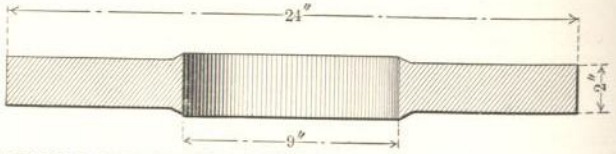
CHICAGO TOOL GRINDER. CHASTE. LIST PRICE $59.00



CHICAGO TOOL GRINDER. CHATTY LIST PRICE $20.50



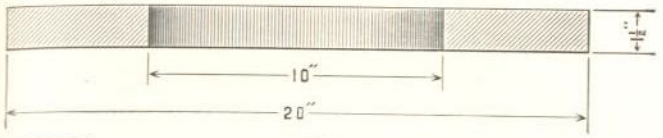
HOYSRADT & CASE NO. 1 TOOL GRINDER HOSTESS LIST PRICE $20.50



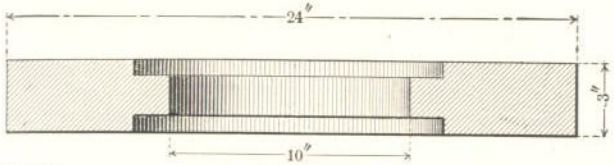
HOYSRADT & CASE NO. 2 TOOL GRINDER HOSTILE LIST PRICE $59.00

American Emery Wheel Works

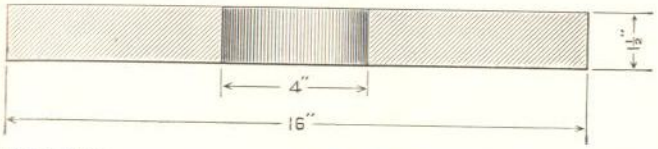
Wheels for **WET TOOL** Grinding Machines



RANSOM TOOL GRINDER RALE LIST PRICE $30.50



RANSOM TOOL GRINDER RALLY LIST PRICE $85.00



LUTTER & GIES GRINDER LUTE (per drawing above) LIST PRICE $20.50
" " " LUTTER 24" x 2" x 4½" LIST PRICE $59.00

Wheels for **CLEVELAND AUTOMATIC** Grinding Machines

	CODE WORD	DIAMETER	THICKNESS	HOLE	LIST PRICE
Tool Grinder	CLEVER	8"	½"	¾"	$3.55
Tool Grinder	CLEVIS	6"	¾"	¾"	2.90

Wheels for **ELECTRIC** Grinding Machines

We manufacture and stock a full and complete line of Grinding Wheels for the following makes of electrically driven grinders. They are practically all plain straight wheels and take list prices as shown on page No. 37.

CINCINNATI ELECTRICAL TOOL CO.

JAS. CLARK, JR., ELECTRIC CO., MFRS. OF THE "WILLEY" LINE

HISEY-WOLF MACHINE CO., MFRS. OF THE "HISEY" LINE

UNITED STATES ELECTRICAL TOOL CO.

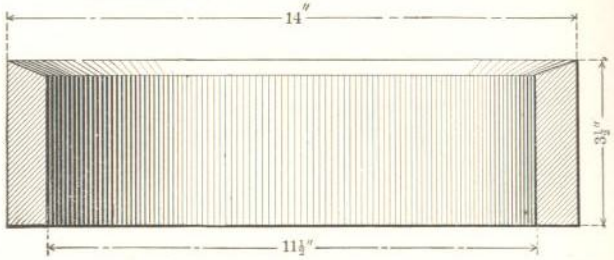
VAN DORN ELECTRIC TOOL CO.

WISCONSIN ELECTRIC CO., MFRS. OF THE "DUMORE" LINE

Wheels for **HEMMING** Grinding Machines

CYLINDER WHEELS

HEMMING CYLINDER (Drawing Below)



MACHINE	CODE WORD	DIAMETER	HEIGHT	HOLE	RIM THICKNESS	LIST PRICE
No. 1 Grinding Machine	HEMLOCK	14″	3½″	11½″	1¼″	$29.05
No. 3 Grinding Machine	HEMP	24″	3½″	21¼″	1½″	73.65
Butcher Knife Grinder	HEND	16″	3¼″	13¼″	1½″	32.80
Chisel Grinder	HEPAR	16″	3¼″	13¼″	1″	32.80
Pocket Knife Grinder	HEPTAD	14″	3½″	12¾″	1⅛″	26.00
Table Knife Grinder	HEPTANE	12″	2⅞″	9¾″	1⅛″	23.70

CUP WHEELS

	CODE WORD	DIAMETER	HEIGHT	HOLE	RIM THICKNESS	BACK THICKNESS	LIST PRICE
Shear Grinder	HERA	14″	5½″	8″	2″	1″	46.70
Side Skate Grinder	HERALD	16″	6½″	11½″	1½″	⅞″	66.85
Bottom Skate Grinder	HERB	10″	6″	6″	1″	¾″	27.75

NOTE.— There are several sizes of Hemming Wheels not shown above, as they are considered obsolete by the builders of the grinder. We are, however, prepared to furnish any of these upon demand.

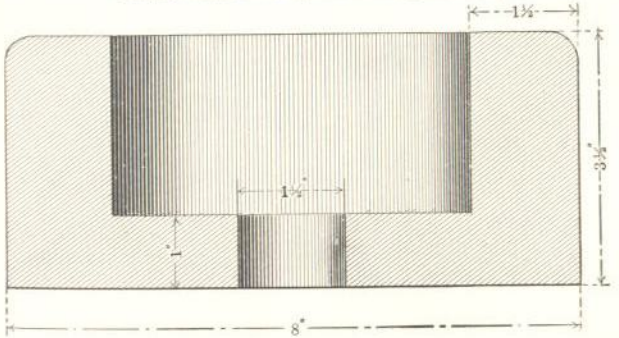
Wheels for **KNIFE** Grinding Machines

STRAIGHT WHEELS

MACHINE	CODE WORD	DIAMETER	THICKNESS	HOLE	LIST PRICE
Seybold	SERUM	30″	1 1/16″	16″	$52.15
Seybold	SERVANT	30″	1½″	16″	61.15
Glencove	GLEAM	26″	1½″	15″	47.00
Am. Wood Working Machinery Co.	AMERCE	26″	1½″	15″	47.00
do.	AMGARN	22″	1½″	1¾″	36.70
do.	AMIC	7″	1″	¾″	4.30
do.	AMIDA	6″	¾″	¾″	2.90
do.	AMIDST	4″	1″	¾″	1.95
Baldwin, Tuthill & Bolton	BALSAM	26″	1½″	1¾″	52.50
Berlin (Yates)	BERYL	4″	⅜″	½″	1.40
Carver Cotton Gin	CARVE	26″	1½″	6″	52.50
" " "	CARVING	26″	1½″	1½″	52.50
Defiance Mach. Co.	DEFIANT	22″	1½″	2″	36.70
Williamsport	WILLING	22″	1½″	1¾″	36.70
S. A. Woods	WOODMAN	26″	1½″	6″	52.50

CUP WHEELS

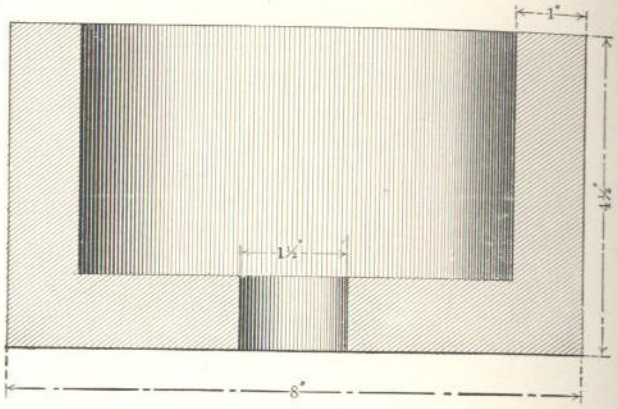
(Buffalo Knife Grinder — S. C. Rogers & Co.)



CODE WORD	DIAMETER	HEIGHT	HOLE	RIM THICKNESS	BACK THICKNESS	LIST PRICE
ROSARY	8″	3½″	1½″	1¼″	1″	$13.70
ROSIN	6″	3″	1″	1″	1″	7.50
ROSTER	10″	3½″	1½″	1¼″	1″	20.70
ROSETTE	12″	4″	2″	1¼″	1″	27.30

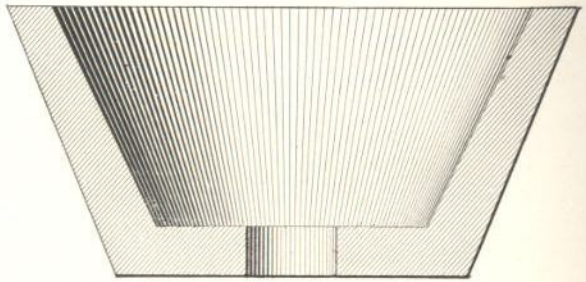
Wheels for KNIFE Grinding Machines

CUP WHEELS—Continued



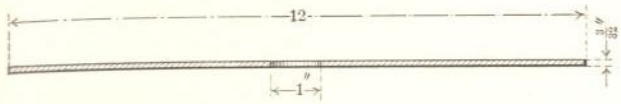
MACHINE	CODE WORD	DIAMETER	HEIGHT	HOLE	RIM THICKNESS	BACK THICKNESS	LIST PRICE
J. A. Fay & Egan	FANCY	8″	4½″	1½″	1″	1″	$18.90
Amer. W. W. Mchry. Co.	AMIGO	8″	4½″	1″	1″	1″	18.90
Baldwin, Tuthill & Bolton	BAMBOO	12″	4″	1″	1¼″	1″	27.30
do.	BANAL	8″	3½″	1″	¾″	¾″	13.70
do.	BANGLE	6″	3″	1″	¾″	¾″	7.50
Capital Machine Co.	CAPRICE	14″	7″	1¾″	1⅛″	1⅛″	52.60

FLARING CUP WHEELS



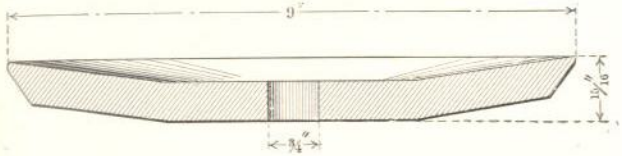
Amer. W. W. Mchry. Co.	AMISS	6″	2½″	¾″	¼″	¾″	6.50
Wardwell 7	WARDEN	3″	2″	½″	5/16″	5/16″	2.30
S. A. Woods	WOODY	6″	2½″	¾″	¼″	¾″	6.50

Wheels for CUTTING OFF Machines



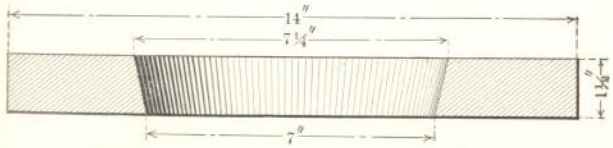
MACHINE	CODE WORD	DIAMETER	THICKNESS	HOLE	LIST PRICE
Slack (Gilman & Son)	SLACKEN	(As per above drawing)			$4.20
Nutter & Barnes	NUTANT	(As per above drawing)			4.20
Matson	NYMPH	12″	3/32″	3/4″	4.20
Racine	RACINE	12″	3/32″	1″	4.20

Wheels for NUTTER & BARNES Saw Sharpening Machine

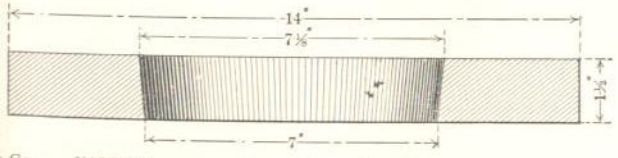


MACHINE	CODE WORD		LIST PRICE
Saw Sharpener	NURTURE	(As per above drawing)	$6.30

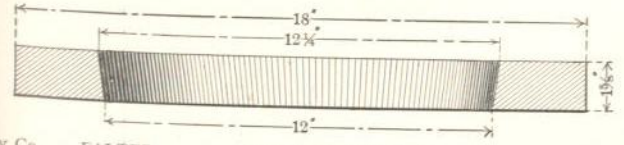
Wheels for ROLL GRINDING Machines



J. Morton Poole Roll Grinder No. 6 — PONIARD — (As per above drawing) — 16.50

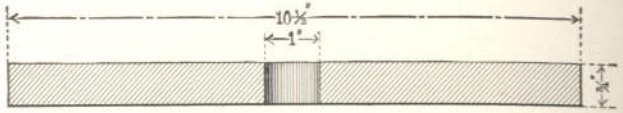


Farrell Foundry Co. Roll Grinder — FALLOW — (As per above drawing) — 16.50



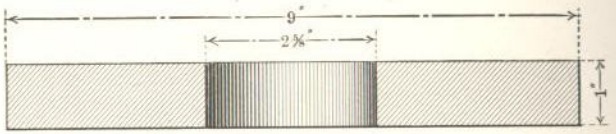
Farrell Foundry Co. Roll Grinder — FALTER — (As per above drawing) — 23.80

Wheels for LEATHER WORKING Machines

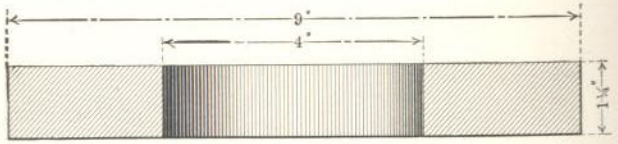


SPLITTING MACHINE. LECTURE. LIST PRICE $7.80

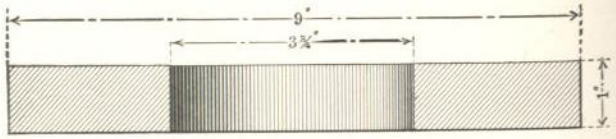
SHAVING MACHINE. LEDGE. LIST PRICE. $4.15



SHAVING MACHINE. LEGACY. LIST PRICE, $6.30



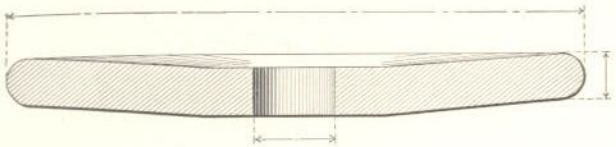
WHITENING MACHINE. LEGEND. LIST PRICE, $7.40



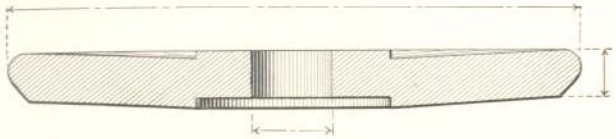
WHITENING MACHINE. LEGION. LIST PRICE $6.30

NOTE—We make wheels for every machine requiring wheels used in tanneries and shoe factories. We have made a specialty of these wheels and our wheels to-day are the standard.

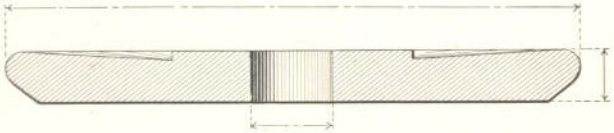
Wheels for SAW GUMMING Machines



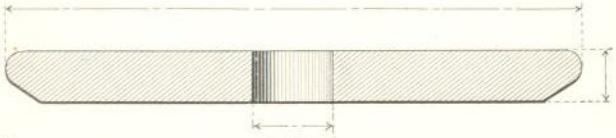
CONCAVE SHAPE SADDLE



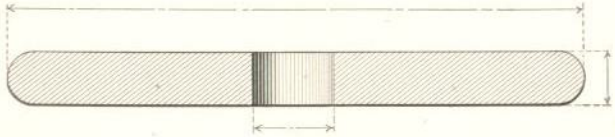
CHURCHILL SHAPE SAGELY



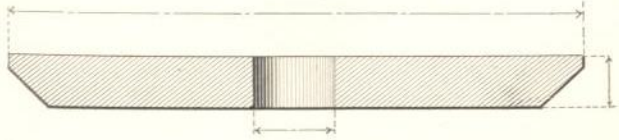
COVEL SHAPE SAILOR



REGULAR WHEEL NO. 4 FACE SALAD



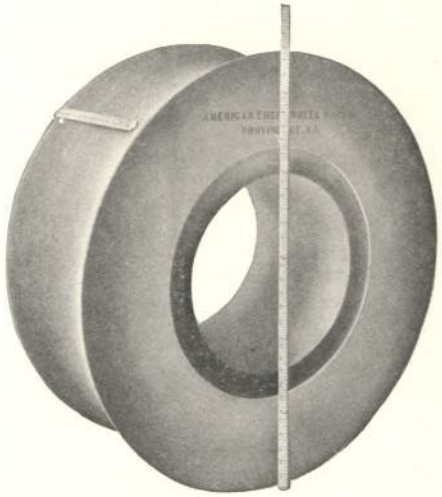
REGULAR WHEEL NO. 9 FACE SALINE



REGULAR WHEEL NO. 3 FACE SALLY

AMERICAN GRINDING WHEELS

FOR UNUSUAL OPERATIONS



THE accompanying illustration is of a large grinding wheel made by the vitrified process. It was 34″ in diameter, 13½″ thick, and the net weight was 640 pounds. It was supplied for automatic grinding of needles. To the best of our knowledge this the largest (combined diameter and thickness) vitrified wheel ever made.

SPECIAL ABRASIVE ROLLS

There has been a constantly increasing demand during the last few years for abrasive rolls for work which was formerly done by means of wooden drums covered with abrasive grains.

In the manufacture of articles such as cork mats, etc., our Carbolite one-piece rolls have proven very successful.

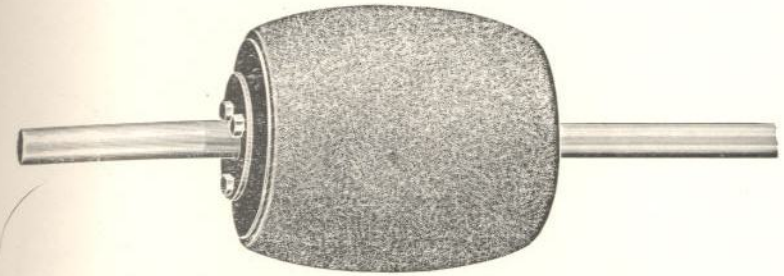
For a special operation on cloth we manufacture Carbolite rolls of various sizes up to 72″ long and 12″ diameter.

These large vitrified rolls are made in sections, and after being finished are assembled.

To overcome the difficult problem of the elimination of the streak or joint mark on the work caused by the slight gap between the roll sections, we have originated a special design of roll section and assembly whereby each end of a section forming a joint is a revolving inclined plane when the roll is in operation.

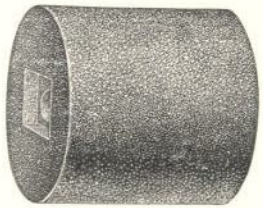
American Emery Wheel Works

DRUM WHEELS



Our Drum Wheels for finishing skins used in making gloves, etc., have met with unqualified approval. They are made by the vitrified process, are porous, and absolutely uniform in grade. The drums are 16″ in diameter at the centre, tapering to 13″ at the ends, and 18″ in length. We furnish the wheel alone, or complete with flanges, bolts and shaft. Prices quoted on application.

BUZZERS



We make Buzzers in a variety of sizes for grinding dies. These are made with a square recess in one end as shown, or with a circular recess, or with no recess at all. Special iron or wood centres are inserted when ordered. We carry them in both coarse and fine numbers.

Sizes most commonly used are as follows:

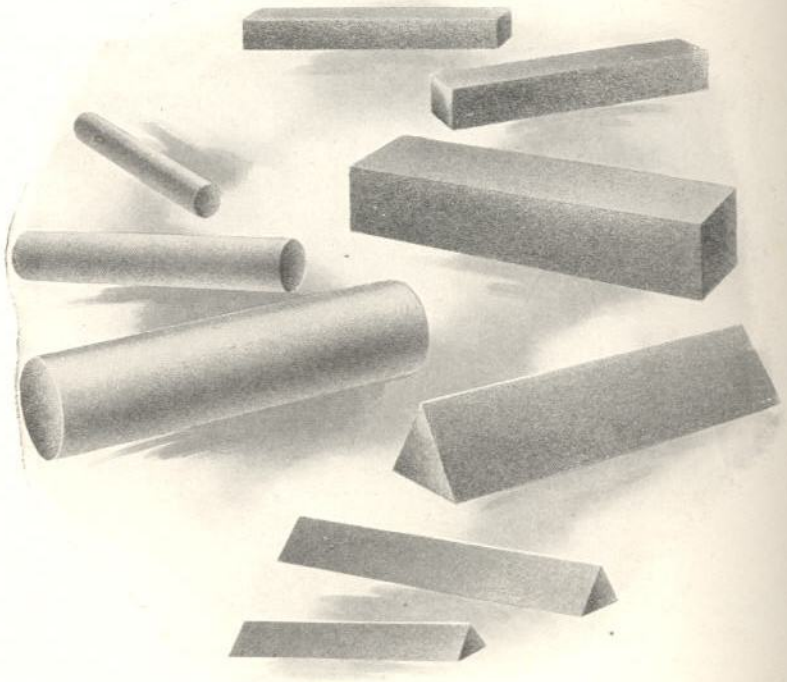
1 inch x 1¾ inch. 1¾ inch x 2 inch. 2 inch x 2 inch.

Prices quoted on application.

CONES AND ROLLS

These are made in such a variety of dimensions that it is impossible to list them. Prices will be quoted upon receipt of specifications.

STICKS



ROUND, TRIANGULAR AND SQUARE

VITRIFIED CORUNDUM AND CARBOLITE STICKS

UNDER this heading we manufacture a great variety of different shapes and sizes of stones. They are used largely for sharpening, grinding or smoothing all kinds of metal by hand, although they are also used on many other materials. They are unexcelled for quick cutting and durability. On page 108 we show the shapes most commonly used, but will be pleased to quote prices on any shapes or sizes desired. We carry these sticks and stones in three finenesses, designated as Coarse, Medium and Fine, but will furnish them in any fineness wanted.

The coarse stones are made of No. 150, the medium of No. F, and the fine of No. SF grains. We furnish them made of Corundum or Carbolite, according to requirements. Where the abrasive is not specified on the order we send Corundum Stones.

PRICE PER DOZEN

Thickness	1/4	3/8	1/2	5/8	3/4	1	1 1/4	1 1/2
4-in. length								
Square	$3.00	$3.00	$3.00	$3.60	$3.60	$4.20	$4.80	$5.40
Triangular	4.20	4.20	4.20	4.80	4.80	5.40	6.00	6.60
Half-Round	4.20	4.20	4.20	4.80	4.80	5.40	6.00	6.60
Round	4.80	4.80	4.80	5.40	5.40	6.00	6.60	7.20
6-in. length								
Square	4.80	4.80	4.80	6.00	6.00	6.60	7.20	7.80
Triangular	5.40	5.40	5.40	6.60	6.60	7.20	7.80	9.00
Half-Round	5.40	5.40	5.40	6.60	6.60	7.20	7.80	9.00
Round	6.60	6.60	6.60	7.80	7.80	8.40	9.00	10.20
8-in. length								
Square			6.60	7.80	7.80	9.00	10.20	11.40
Triangular			9.00	10.20	10.20	11.40	12.00	12.60
Half-Round			9.00	10.20	10.20	11.40	12.00	12.60
Round			10.20	11.40	11.40	12.60	13.20	13.80
10-in. length								
Square				10.20	10.20	10.80	12.00	13.20
Triangular				11.40	11.40	12.60	13.80	15.00
Half-Round				11.40	11.40	12.60	13.80	15.00
Round				13.20	13.20	14.40	15.00	15.60

AMERICAN OIL STONES

AMERICAN Oil Stones are the result of years of study and experiments. Actual tests have proven them to be the most rapid cutting and durable oil stones made. Our process of manufacture produces stones that are uniform in hardness and texture. They will keep an even, clean surface longer than any other stones. They are nicely finished, and have true surfaces and sharp corners.

American Oil Stones are the most efficient for sharpening all kinds of tools requiring a keen edge, such as are used by machinists, woodworkers, engravers, leatherworkers, jewelers, etc.

American Oil Stones are made in three finenesses or grits,—Coarse, Medium and Fine.

Coarse stones are for sharpening heavy tools, or tools that are very dull or nicked, or in general where the fast removal of metal is more essential than a very fine finish.

Medium stones are largely used by machinists, carpenters, and others, for keeping a medium fine edge on their tools from day to day.

Fine stones are especially adapted for engravers, dieworkers, and all mechanics whose work requires that their tools have very fine, keen edges.

If the surface becomes filled, these stones may be readily cleaned with kerosene, or by rubbing with a piece of coarse grinding wheel.

We make these stones in any shapes desired. On page 111 we show list prices of shapes most commonly used. Illustrations are shown on pages 112 and 113. Shapes No. 0, 1½ and 29 can be furnished in polished wooden boxes.

American Emery Wheel Works

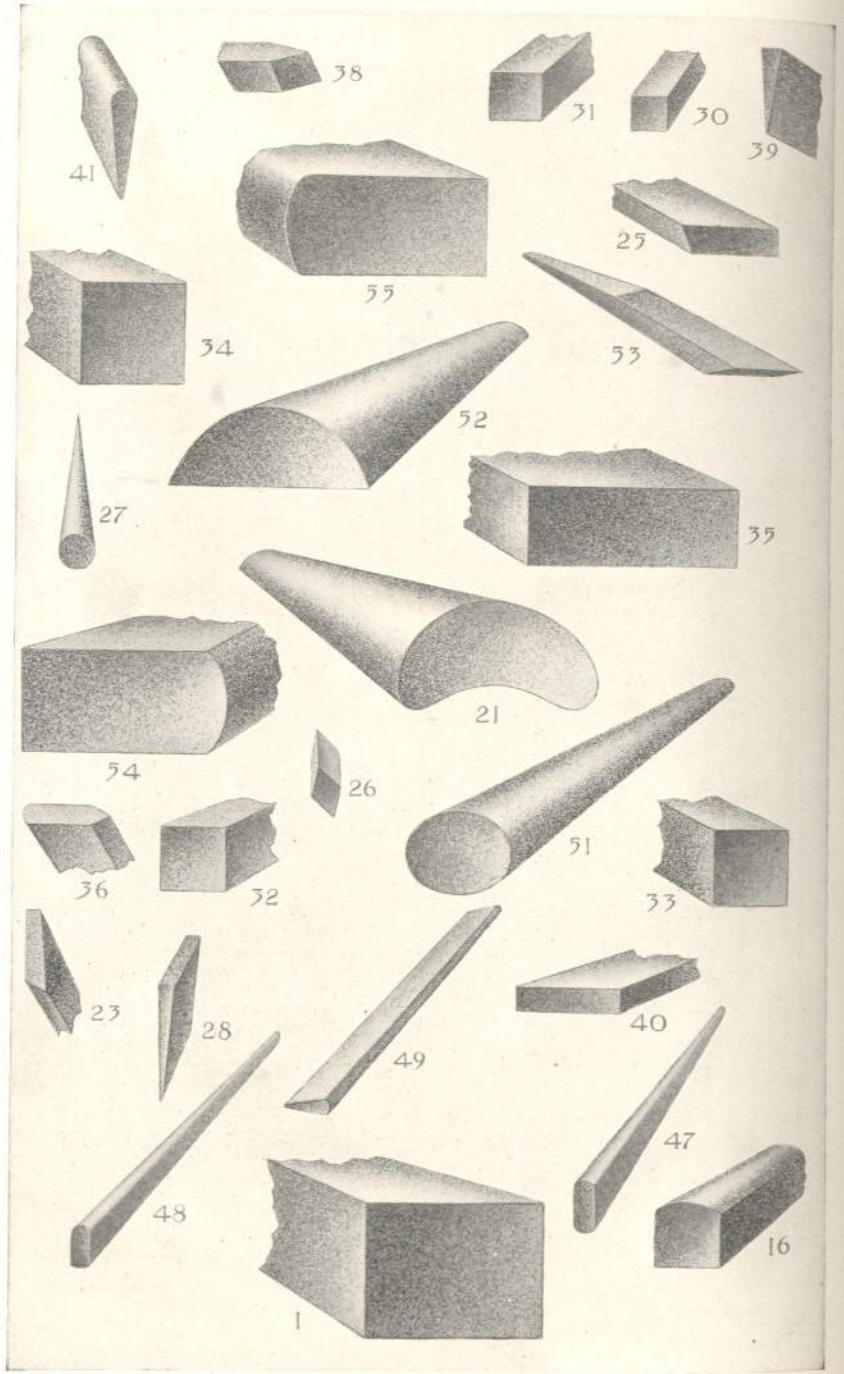
AMERICAN OIL STONES

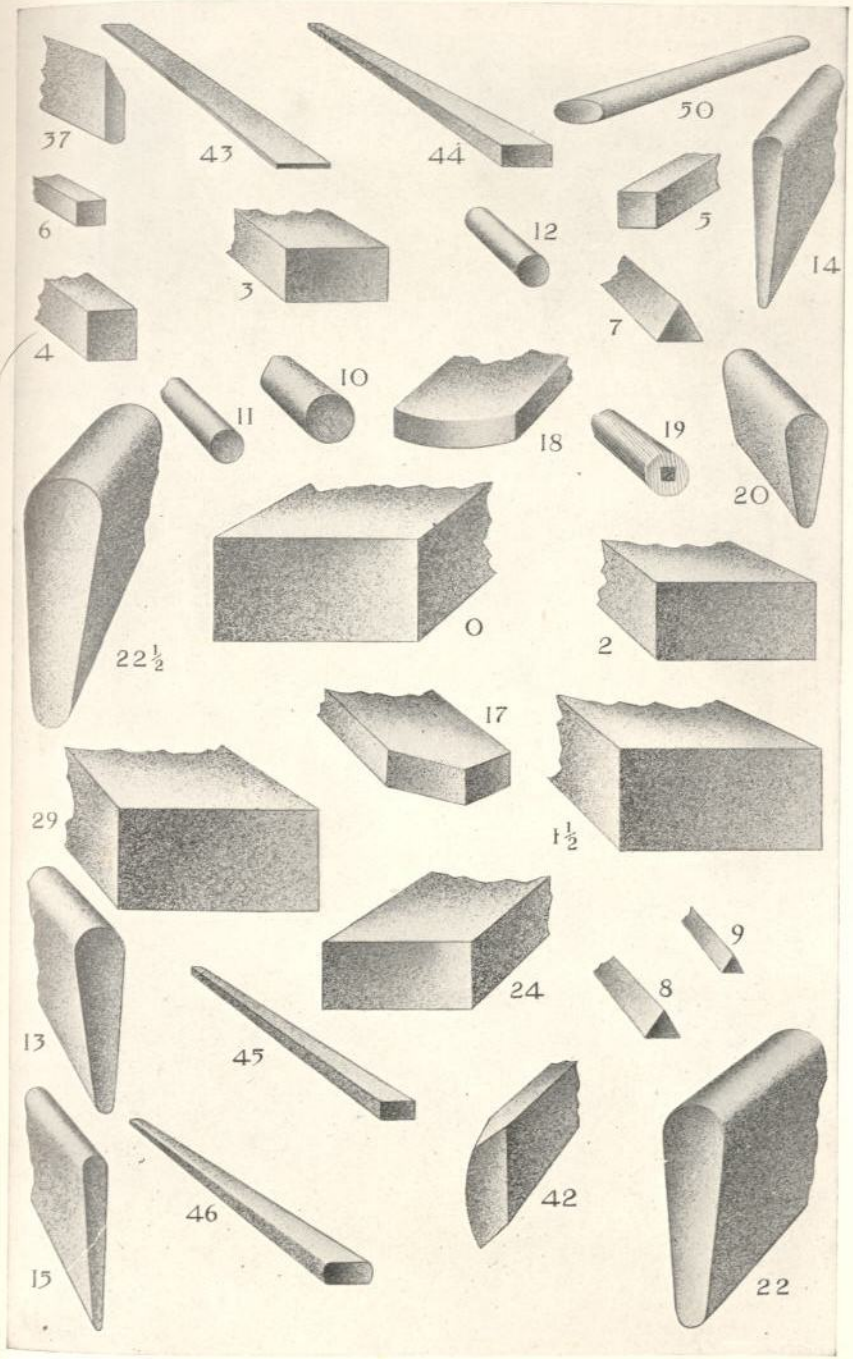
(Coarse, Fine or Medium)

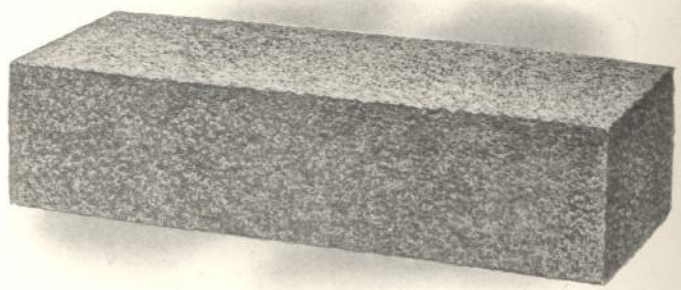
Shape No.	DIMENSIONS	Price Each
0	8 x 2 x 1	$1.75
*0	8 x 2 x 1, Combination	2.25
1	8 x 1¾ x 1¼	2.00
1½	7 x 2 x 1	1.50
*1½	7 x 2 x 1, Combination	2.00
2	6 x 1⅝ x ¾	1.00
3	4 x 1 x ½	.60
4	4 x ½ x ½, Square	.50
5	4 x ⅜ x ⅜, "	.50
6	4 x ¼ x ¼, "	.50
7	4 x ½ x ½, Triangular	.65
8	4 x ⅜ x ⅜, "	.65
9	4 x ¼ x ¼, "	.65
10	4 x ½, Round	.70
11	4 x ⅜, "	.70
12	4 x ¼, "	.70
13	4½ x 1¾ x ½/16	.75
14	4½ x 1¾ x ⅜/⅛	.75
15	4½ x 1¾ x ¼/16	.75
16	8 x ⅝ x ⅝	1.10
17	4 x 1¼ x ⅜	.65
18	4 x 1¼ x ⅜	.65
19	Engravers' Pencils, 4 x ½ Round, ⅛ sq. Hole	.65
20	4 x 1 x 7/16/3/16	.65
21	6 x 2 x 1 x ⅜ x 3/16	1.50
22	4½ x 2⅛ x ⅝/5/16	1.00
22½	6 x 2¼ x ¾/⅜	1.25
23	3½ x ¾ x 3/16 x ⅛	.50
24	4½ x 1½ x ⅝	.75
25	4½ x 1 x 5/16	.50
26	4 x 9/16 x 3/16	.90
27	3 x 5/16	.90

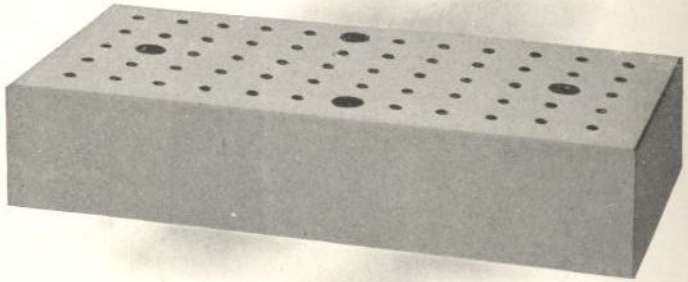
Shape No.	DIMENSIONS	Price Each
28	4 x 1 x ⅛	$.70
29	6 x 2 x 1	1.25
*29	6 x 2 x 1, Combination	1.75
30	6 x ⅜ x ⅜, Square	.70
31	6 x ½ x ½ "	.70
32	6 x ⅝ x ⅝ "	.70
33	6 x ¾ x ¾ "	.85
34	6 x 1 x 1 "	.85
35	2 x 2 x ¾	.65
36		
37		
38	2¼ x ⅞ x 3/16, per Set of 4	2.00
39		
40	2 x 1 x ¼	.40
41	5 x 1 x 5/16 x 3/32	.70
42	4 x 1 x ¼	.65
43	4 x ½ x 1/16	.85
44	4 x ½ x ¼ x 5/16 x ⅛	.85
45	4 x 5/16 x 3/16 x 5/16 x 1/16	.85
46	4 x ½ x ¼ x 5/16 x ⅛	.85
47	4 x ½ x 3/16 x 3/16 x 1/16	.85
48	4 x ⅜ x 3/16 x ⅛ x 1/16	.85
49	4 x 7/16 x 3/16 x ⅛	.85
50	3½ x 7/16 x 3/16	.85
51	6 x ⅞ x 5/16	1.10
52	Heel Breasting Stone, 6 x 2 x ⅞	.70
53	Automobile Vibrator Stone, 4 x 9/16 x ¼ x 1/16	.65
54	8 x 2 x 1	2.00
55	7 x 2 x 1	1.75

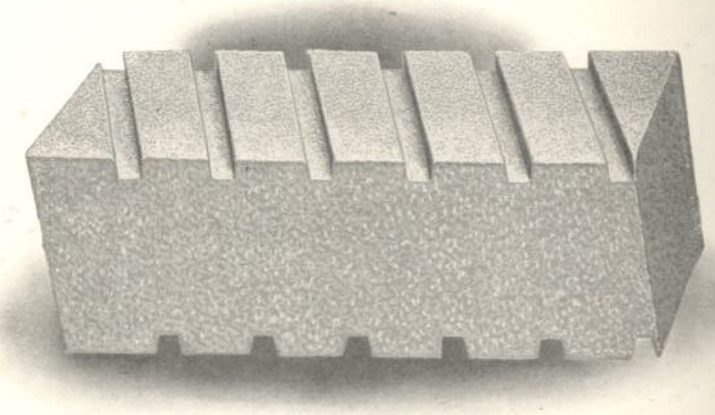
* Combination Stones are Coarse on one side and Medium or Fine on other side.











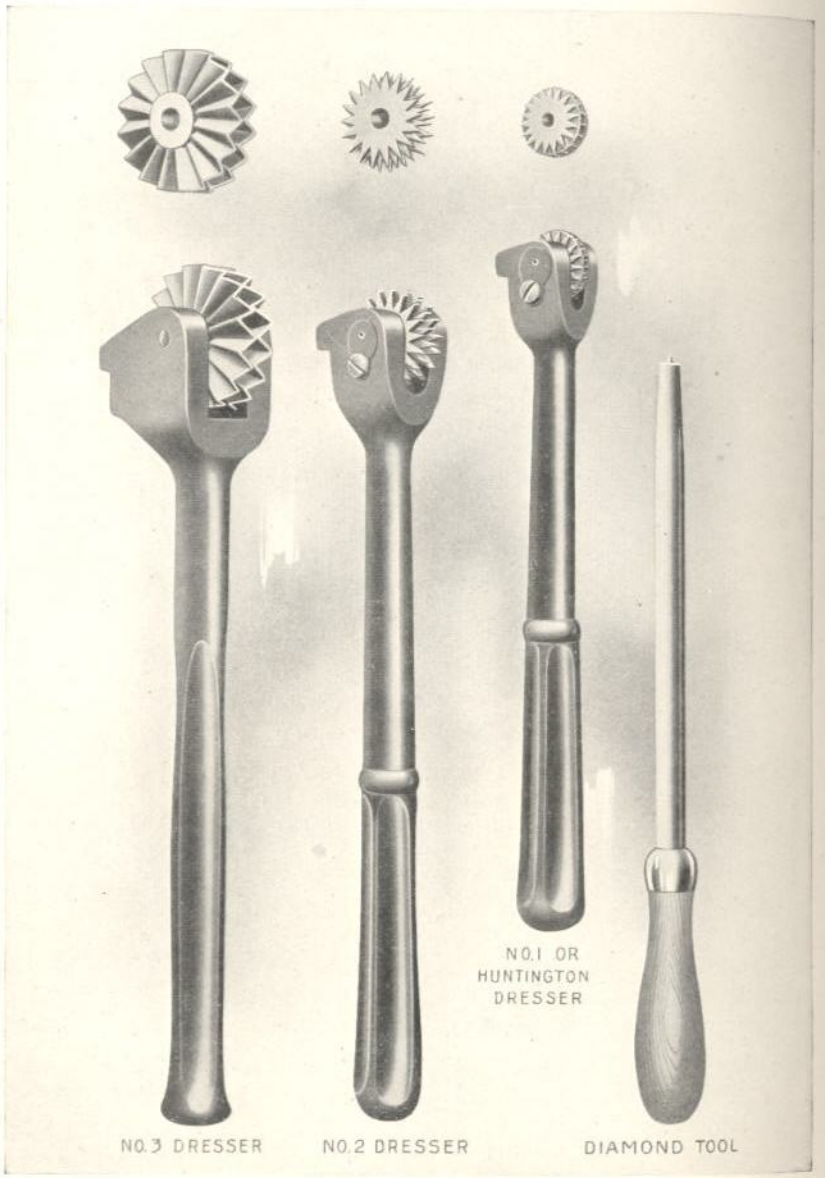
RUBBING BRICKS

BRICKS are made of either Corundum or Carbolite in a variety of sizes, shapes, and grains. They are used for scouring castings, general foundry work, dressing and smoothing marble and granite, scouring chilled iron rolls, and similar work. Bricks can often be used advantageously for truing up or dressing grinding wheels. Special perforated bricks are supplied for rubbing down castings after filling, and for rubbing down varnish on patent leather, and bricks with fluted sides are supplied for rubbing down concrete, and similar work.

The list below shows the standard sizes of plain bricks, but we are prepared to supply any special size or shape of brick, in either Corundum or Carbolite, in any desired grain.

PRICE LIST

	PER DOZEN		PER DOZEN
4 x 1 x ¼″	$2 40	6 x 2 x 2″	$10 80
4 x 1 x ½″	2 40	6 x 3 x 2″	14 40
4 x 2 x ½″	3 60	6 x 3 x 3″	21 60
4 x 2 x 1″	4 80	8 x 2 x 1″	7 80
4 x 2 x 2″	7 80	8 x 2 x 2″	12 60
4 x 3 x 2″	10 80	8 x 3 x 2″	18 00
4 x 3 x 3″	14 40	8 x 3 x 3″	28 80
4 x 4 x 4″	24 00	8 x 4 x 2″	24 00
6 x 2 x ½″	4 20	8 x 4 x 3″	36 00
6 x 2 x 1″	6 00	8 x 4 x 4″	48 00



American Emery Wheel Works

DIAMOND TOOLS

○ ○ ○

FOR fine wheels or for wheels requiring a special shape of cutting edge, and for wheels used on cylindrical grinding machines or tool and cutter grinders, a diamond tool is required. As large users of diamonds, our experience in the selection of stones may be of assistance to our customers.

We furnish diamonds mounted in hand tools as shown on opposite page, in lathe tools, or unmounted. Prices vary according to the size and quality of the stone and condition of the diamond market. Quotations furnished upon application.

GRINDING WHEEL DRESSERS

○ ○ ○

The dressers shown on the opposite page are the most efficient and durable that can be had.

The No. 1 dresser, 12 inches long, is recommended for small and medium sized wheels, while the No. 2 and No. 3 dressers, both 14 inches long, are especially adapted for large, coarse and hard wheels.

Each dresser is furnished with an additional set of cutters.

PRICE LIST

No. 1 (or Huntington) dresser	$1.25
Extra cutters for No. 1 dresser, per set	.15
No. 2 dresser	2.50
Extra cutters for No. 2 dresser, per set	.40
No. 3 dresser	2.50
Extra cutters for No. 3 dresser, per set	.40

TELEGRAPH AND CABLE CODE

ADDRESS: - AMERY, PROVIDENCE

CODE FOR WHEEL DIMENSIONS, GRAIN AND GRADE

Diameter		Thickness		Hole		Grain		Grade			
								Vitrified		Silicate	
1/2	AB	1/16	EA	1/8	IB	14	OA	E	UE	1/2	BY
5/8	AC	1/8	EB	3/16	IC	16	OB	F	UF	3/4	CY
3/4	AD	3/16	EC	1/4	ID	20	OC	G	UG	1	DY
7/8	AE	1/4	ED	5/16	IE	24 comb.	OO	H	UH	1 1/4	FY
1	AF	5/16	EE	3/8	IF	24	OD	I	UI	1 1/2	GY
1 1/8	AG	3/8	EF	7/16	IG	30	OE	J	UJ	1 3/4	HY
1 1/4	AH	7/16	EG	1/2	IH	36	OF	K	UK	2	JY
1 3/8	AI	1/2	EH	9/16	II	40	OG	L	UL	2 1/4	KY
1 1/2	AJ	9/16	EI	5/8	IJ	46	OH	M	UM	2 1/2	LY
1 5/8	AK	5/8	EJ	3/4	IK	50	OI	N	UN	3	MY
1 3/4	AL	3/4	EK	7/8	IL	54	OJ	O	UO	3 1/2	NY
1 7/8	AM	7/8	EL	1	IM	60	OK	P	UP	4	PY
2	AN	1	EM	1 1/8	IN	70	OM	Q	UQ	4 1/2	QY
2 1/2	AO	1 1/8	EN	1 1/4	IO	80	ON	R	UR	5	RY
3	AP	1 1/4	EO	1 3/8	IP	90	OP	S	US	5 1/2	SY
3 1/2	AQ	1 3/8	EP	1 1/2	IQ	100	OQ	T	UT	6	TY
4	AR	1 1/2	EQ	1 5/8	IR	120	OS	U	UU	6 1/2	VY
4 1/2	AS	1 5/8	ER	1 3/4	IS	140	OU	V	UV	7	WY
5	AT	1 3/4	ES	1 7/8	IT	150	OV	W	UW		
6	AU	1 7/8	ET	2	IU	180	OY	X	UX		
7	AV	2	EU	2 1/4	IV	200	BO	Y	UY		
8	AW	2 1/4	EV	2 1/2	IW	220	CO	Z	UZ		
9	AX	2 1/2	EW	2 3/4	IX	Flour	OL				
10	AY	2 3/4	EX	3	IY	XF	DO				
12	AZ	3	EY	3 1/4	IZ						
14	BA	3 1/2	EZ	3 1/2	BI						
15	CA	4	BE	3 3/4	CI						
16	DA	4 1/2	CE	4	DI						
18	EA	5	DE	4 1/2	FI						
20	FA	5 1/2	FE	5	GI						
22	GA	6	GE	5 1/2	HI						
24	HA	6 1/2	HE	6	JI						
26	IA	7	JE	6 1/2	KI						
28	JA	7 1/2	KE	7	LI						
30	KA	8	LE	7 1/2	MI						
32	LA			8	NI						
34	MA			8 1/2	PI						
36	NA			9	QI						
40	QA			10	SI						
48	UA			12	VI						

Elastic	
1/2	CU
1	DU
1 1/2	FU
2	GU
2 1/2	HU
3	JU
3 1/2	KU
4	LU
4 1/2	MU
5	NU
6	PU
7	QU

EXAMPLE:—To telegraph for 6 wheels, 12 x 2 x 5 No. 60, Grade P, "SIX AZEUGIOKUP."

For Special Wheels use Code Words on pages 44 to 105.

SHAPE OF WHEEL FACES (See page 34)

Shape of Face No. 1	**Facewun**	Shape of Face No. 8	**Faceate**
Shape of Face No. 2	**Facetoo**	Shape of Face No. 8A	**Faceatea**
Shape of Face No. 3	**Facethree**	Shape of Face No. 9	**Facenine**
Shape of Face No. 4	**Facefore**	Shape of Face No. 10	**Faceten**
Shape of Face No. 5	**Facefiv**	Shape of Face No. 11	**Facelevn**
Shape of Face No. 6	**Facesiks**	Shape of Face No. 12	**Facetwelv**
Shape of Face No. 7	**Facesevn**	Shape of Face No. 13	**Facethrten**

All wheels are furnished with square (No. 1) faces unless otherwise ordered.

American Emery Wheel Works

TELEGRAPH AND CABLE CODE

Ship by express or parcel post	**Tackle**
Ship by freight	**Taffyish**
Ship by boat	**Taggish**
When will you ship order	**Taggalong**
How soon could you ship	**Tainted**
If ordered at once we can ship	**Talcumish**
We could ship .....days after receipt of order	**Talkish**
Are shipping this week	**Tamborine**
We will ship in one week	**Tangoing**
We will ship in two weeks	**Tankard**
We will ship in three weeks	**Tantalize**
We will ship in four weeks	**Tantrum**
Replying to your cable (letter) partial shipment has been made, balance	**Tapster** **Tarnish**
Ship part at once by express, balance by freight	**Tartan**
Order delayed. Wheels came from kilns (or ovens) unsatisfactory. Are rushing another lot	**Taste**
Suspend order .....Are writing	**Tatting**
Order .....is suspended awaiting your reply to letter or telegram of	**Taunting**
Duplicate our order	**Tautog**
Duplicate your requisition	**Taxicab**
Telegraph price and delivery on	**Taximeter**
As per our letter of	**Taxidriver**
Send sample or stub of satisfactory wheels	**Tennis**
Sample or stub not received	**Terminal**
Send sketch of what is required	**Termite**
Advise nearest you could ship at once	**Terrapin**
Nearest we have in stock is (are)	**Terrorize**
We do not understand your telegram. Repeat	**Terrorism**

CLASS OF WORK

Same as last	**Tonsorial**
For finishing	**Toothache**
Car wheel grinding	**Topical**
Gumming and sharpening saws	**Torment**
Drop forgings	**Tornado**
Reamers, taps, milling cutters, etc. (special machines)	**Torpor**
Reamers, taps, milling cutters, etc. (hand grinding)	**Torrent**
Twist drills, special machines	**Tortoise**
Twist drills, hand grinding	**Touching**
Wood-working tools	**Tourist**
For wet tool grinding	**Towboat**
Small tools	**Towpath**
Lathe and planer tools	**Towering**
General machine shop use	**Township**
Rough work in general	**Trespass**
Brass and bronze castings	**Tribunal**
Steel castings	**Trickle**
Wrought iron	**Trillion**
Chilled iron castings	**Trinity**
Small malleable iron castings	**Trinket**
Large malleable iron castings	**Triumph**
Small cast iron and steel castings	**Trolley**
For rough work on castings	**Trombone**

In addition to above code words, when necessary, please use Lieber's Code A. B. C. Code, 5th Edition, or Western Union Code.

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