

CS7-29

Unions, Standard Weight Malleable Iron or Steel Screwed

**U. S. DEPARTMENT OF COMMERCE
BUREAU OF STANDARDS**

STANDARD WEIGHT MALLEABLE IRON OR STEEL SCREWED UNIONS

COMMERCIAL STANDARD CS7-29



**ELIMINATION OF WASTE
Through
SIMPLIFIED COMMERCIAL PRACTICE**

Below are described some of the series of publications of the Department of Commerce which deal with various phases of waste elimination.

Simplified Practice Recommendations.

Present in detail the development of programs to eliminate unnecessary variety in sizes, dimensions, styles, and types of over 100 commodities. They also contain lists of associations and individuals who have indicated their intention to adhere to the recommendations. These simplified schedules, as formulated and approved by the industries, are indorsed by the Department of Commerce.

Commercial Standards.

These are developed by various industries under a procedure similar to that of simplified practice recommendations. They are, however, primarily concerned with considerations of grade, quality, and such other characteristics as are outside the scope of dimensional simplification.

American Marine Standards.

These are promulgated by the American Marine Standards Committee, which is controlled by the marine industry and administered as a unit of the division of simplified practice. Their object is to promote economy in construction, equipment, maintenance, and operation of ships. In general, they provide for simplification and improvement of design, interchangeability of parts, and minimum requisites of quality for efficient and safe operation.

Lists of the publications in each of the above series can be obtained by applying to the Division of Trade Standards, Bureau of Standards, Washington, D. C.

U. S. DEPARTMENT OF COMMERCE

R. P. LAMONT, Secretary

BUREAU OF STANDARDS

GEORGE K. BURGESS, Director

STANDARD WEIGHT MALLEABLE IRON OR STEEL SCREWED UNIONS

COMMERCIAL STANDARD CS7-29

[ISSUED FEBRUARY 15, 1930]

**Effective Date For New Production, November 1, 1929
For Clearance of Existing Stocks, May 1, 1930**



**UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1930**

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COMMERCIAL STANDARD CS7-29

ACCEPTORS

ASSOCIATIONS

American Hotel Association.
American Specification Institute.
Central Supply Association.
Eastern Supply Association.
Heating and Piping Contractors District of Columbia Association (Inc.).
National Association of Building Owners and Managers.
National Association of Master Plumbers.
National Association of Purchasing Agents.
National School Supply Association.

FIRMS

American Chain Co. (Inc.), Bridgeport, Conn.
Central Forging Co., The, Catawissa, Pa.
Central Railroad Co. of New Jersey, The, New York, N. Y.
Clow & Sons, James B., Chicago, Ill.
Connor Universal Union Co., Lockport, N. Y.
Corley-DeWolfe Co., Elizabeth, N. J.
Delaware Electric & Supply Co., Wilmington, Del.
Delaware, Lackawanna & Western Railroad Co., The, New York, N. Y.
Detroit Brass & Malleable Works, Detroit, Mich.
Essex Foundry, New York, N. Y.
Flagg & Co. (Inc.), Stanley G., Philadelphia, Pa.
Hajoca Corporation, Philadelphia, Pa.
Jefferson Union Co. (Inc.), Lexington, Mass.
King Union Co. (Inc.), Hills Grove, R. I.
Lloyd's Register of Shipping, New York, N. Y.

Macy & Co. (Inc.), R. H., New York, N. Y.
Messer Co. (Inc.), James A., Washington, D. C.
Nelson Manufacturing Co., N. O., St. Louis, Mo.
Olson Co., Ben, Tacoma, Wash.
Power magazine (in principle), New York, N. Y.
Providence Fittings Co., Lexington, Mass.
Rhode Island Fittings Co., Providence, R. I.
Rockwood Sprinkler Co. of Massachusetts, Worcester, Mass.
Roe (Inc.), William S., Newark, N. J.
Romort Manufacturing Co., Oakfield, Wis.
Sacket Foundry Co., Monrovia, Calif.
Schafer Co., E. G., Washington, D. C.
Standard Supply Co., The, Portsmouth, Ohio.
Standard Union Co., New York, N. Y.
Thompson, Roy E., Tacoma, Wash.
Union Malleable Manufacturing Co., The, Ashland, Ohio.
Vegt Machine Co., Henry, Louisville, Ky.
Warren Tool & Forge Co., The, Warren, Ohio.
Weakley Watson Miller Hardware Co., Brownwood, Tex.
Weekes & Son Co., John, Watertown, N. Y.
Western Electric Co. (Inc.), New York, N. Y.
Wilson Hardware Co., E. L., Beaumont, Tex.

GOVERNMENT

Federal Specifications Board (in principle), Washington, D. C.
Government of the District of Columbia, Washington, D. C.

STANDARD WEIGHT MALLEABLE IRON OR STEEL SCREWED UNIONS

COMMERCIAL STANDARD CS7-29

On September 24, 1928, a joint conference of representative manufacturers, users, and general interests adopted a commercial standard for standard weight malleable iron or steel screwed unions. The industry has since accepted and approved for promulgation by the Department of Commerce the specification as shown herein.

The commercial standard is effective from November 1, 1929, for new production. Existing manufacturers' stocks of nonstandard items are to be cleared by May 1, 1930.

Promulgation recommended.

R. M. HUDSON,
Assistant Director for Commercial Standards.

Promulgated.

GEORGE K. BURGESS,
Director, Bureau of Standards.

APPROVED.

R. P. LAMONT,
Secretary of Commerce.

COMMERCIAL STANDARD CS7-29

I. TYPES

Malleable iron or steel unions for use with standard-weight pipe are furnished in the following types: Black, brass seated; galvanized, brass seated.

II. MATERIAL AND WORKMANSHIP

With the exception of the brass seats, all parts shall be made of a high-grade malleable iron thoroughly annealed, or of mild steel. No copper or rusting solution shall be used. Workmanship shall be first class in every particular.

III. GENERAL REQUIREMENTS

All parts shall be sound, true to form, and free from defects that may affect their serviceability. They shall be thoroughly cleaned from sand and scale.

Unions shall be tapped with taper threads in accordance with American Standard B2-1919 for pipe threads.

Seat and shoulder contact surfaces shall be finished smooth and true.

Union pipe ends may be polygonal, round, or round with lugs.

Representative unions from each lot shall be subjected to not less than 20 pounds air pressure under oil or water during production, and unions that show any leakage shall be rejected. Additional pressure tests shall be at the expense of the purchaser.

IV. DETAIL REQUIREMENTS

1. Dimensions shall conform to Table 1 and Figure 1, which form part of this specification.

2. Unions shall be of either malleable iron or mild steel. A brass ring shall be secured in the female portion of the union so as to become an integral part of same and to form a bearing for the male portion, or the female portion may be manufactured of brass or bronze. The seat of the male portion may be either brass, malleable iron, or mild steel. Unions shall be furnished with either ball and socket, ball to cone, or cone to cone joint.

3. Galvanized unions shall be thoroughly zinc coated by the hot-dipped process and so treated as to assure a smooth surface. They shall be galvanized inside and outside before machining and thread cutting.

TABLE 1

Union dimensions (see fig. 1)	Size of pipe							
	½-inch	¾-inch	⅞-inch	1-inch	1¼-inch	1½-inch	2-inch	
<i>a</i> , ± 0.125 inch.....	1.484	1.641	1.766	2.000	2.141	2.500	2.703	3.234
<i>b</i> , Minimum.....	.085	.090	.095	.105	.110	.120	.130	.165
<i>c</i> , Minimum.....	.105	.105	.109	.114	.119	.127	.133	.171
<i>d</i> , Number of sides, maximum.....	8	8	8	8	8	8	8	10

NOTE.—While dimensions for 2½ and 3 inch sizes are not given above, provision for these sizes is made in the tensile test requirements of Section V.

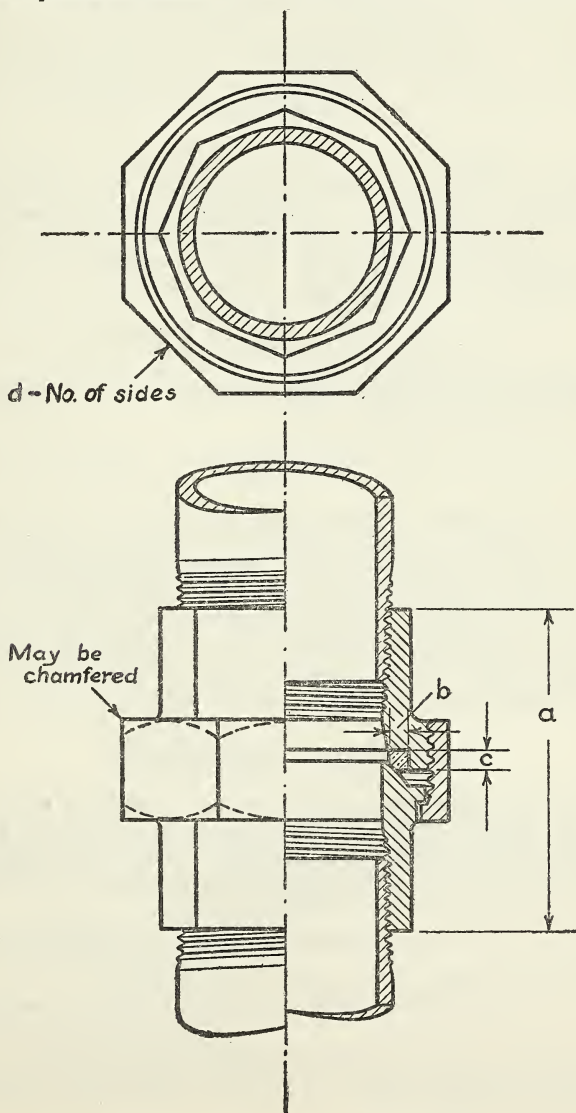


FIGURE 1.—Standard weight union

V. TENSILE TEST

Unions shall conform to the minimum tensile test requirements given in Table 2. The tensile test shall be conducted by inserting solid bars corresponding in outside diameter to the pipe, threaded and screwed into each end of the union.

TABLE 2

Size (inches)	Ultimate breaking load	Size (inches)	Ultimate breaking load
	<i>Pounds</i>		<i>Pounds</i>
$\frac{1}{4}$ -----	3,800	$1\frac{1}{4}$ -----	21,300
$\frac{3}{8}$ -----	5,300	$1\frac{1}{2}$ -----	25,800
$\frac{1}{2}$ -----	7,700	2-----	30,000
$\frac{3}{4}$ -----	10,600	$2\frac{1}{2}$ -----	35,000
1-----	15,500	3-----	40,000

Purchaser, at his own expense, may require the testing, in accordance with above paragraph, of representative samples from any lot purchased. For each sample rejected by such test, two additional samples shall be tested, failure of either of which shall cause rejection of the entire lot represented by the samples.

VI. PACKING AND MARKING

The manufacturers' name, brand name, or trade-mark shall be permanently marked on each union.

VII. NOTES

American Petroleum Institute line pipe threads are longer than commercial standard threads although of the same pitch diameter. (Reference A. P. I. Standards 5-L. Procurable from A. P. I. division of standardization, 1508 Kirby Building, Dallas, Tex.) Care should be exercised in furnishing fittings to the oil industry, that no interference exists in the threaded portion of the fitting that will prevent the projection of the longer A. P. I. line pipe thread beyond the end of the commercial standard thread in the fitting.

GENERAL CONFERENCE

Following two preliminary conferences of interested manufacturers, held on May 28 and June 21, 1928, and at the request of the latter conference, a general conference of representative interests was held on September 24, 1928, at the Department of Commerce, Washington, D. C. The following individuals were present:

AFFLECK, MYRON H. S., Star Manufacturing Co., 71 Willard Avenue, Providence, R. I.

BRYANT, ROBERT E., Jefferson Union Co., Lockport, N. Y.

CADY, STANLEY G., Rhode Island Fittings Co., 123 Georgia Avenue, Providence, R. I.

CHAMPLIN, GEORGE S., Dart Manufacturing Co., Providence, R. I.

CORLEY, RALPH A., Corley DeWolfe Co., 323 Pine Street, Elizabeth, N. J.

DARLING, C. E., American Society of Mechanical Engineers, 29 West Thirty-ninth Street, New York, N. Y.

FLAGG, STANLEY G., Stanley G. Flagg Co. (Inc.), 1421 Chestnut Street, Philadelphia, Pa.
 FOLLETTE, A. G., Committee on Standardization and Simplification, purchase and stores division, American Railway Association, Pennsylvania Railroad, Philadelphia, Pa.
 FREEMAN, ARTHUR W., Jefferson Union Co., Lexington, Mass.
 GOFF, J. MILTON, E. M. Dart Manufacturing Co., Providence, R. I.
 MELOON, J. C., General Fire Extinguisher Co., Providence, R. I.
 RAMAGE, JAMES E., Domestic Engineering Co., 110 East Forty-second Street, New York, N. Y.
 RANDELL, DUNCAN D., American Gas Association, Washington Gas Light Co., Washington, D. C.
 SMITH, H. E., New York Central Lines, 466 Lexington Avenue, New York, N. Y.
 WELLINGTON, E. C., Providence Fittings Co., 7 Water Street, Boston, Mass.
 WILLIAMS, K. D., Bureau of Engineering, Navy Department Washington, D. C.
 WINDSOR, CHARLES H., Standard Union Co., Boston, Mass.
 BECKER, LUTHER, Bureau of Foreign and Domestic Commerce, chief, iron and steel division, Washington, D. C.
 FAIRCHILD, I. J., division of trade standards, Bureau of Standards, Washington, D. C.

The proposed commercial standard for malleable iron or steel screwed unions, as modified by the preliminary conferences, was considered in detail and a few changes were accepted.

It was the consensus of opinion that unions described herein should be classified as "Standard weight" rather than "250 pound" so as to avoid confusion with the pressure classifications set up for cast-iron and malleable-iron screwed fittings. These unions are for use with standard-weight pipe, although they have frequently been described in the trade as 250-pound unions. They should not be confused with "Extra-heavy" or "300-pound" unions for more severe service with extra-heavy pipe.

A number of detailed dimensions previously included were eliminated by the conference.

EFFECTIVE DATE

The conference originally recommended May 1, 1929, as effective date for new production, and November 1, 1929, as effective date for clearance of existing stocks. It later became necessary to incorporate certain minor suggestions, and since final acceptance was delayed thereby it is understood that effective date for new production will be November 1, 1929, and that existing stocks of nonstandard unions are to be cleared by May 1, 1930.

STANDING COMMITTEE

The following standing committee was appointed to consider annually any comments or suggestions as to changes in the standard in order that it may be kept continuously in accord with the desires of the industry and the advance in the art:

R. E. Bryant, Jefferson Union Co.
 M. H. S. Affleck, Star Manufacturing Co.
 S. G. Cady, Rhode Island Fittings Co.
 A. G. Getty, manager, Standard Sanitary Manufacturing Co.
 George M. Bridgman, Hajoca Corporation.
 Walter V. Sippel, Fleck Bros. Co.
 J. C. Meloan, General Fire Extinguisher Co.
 H. E. Heil, Peoples Gas Light & Coke Co., Chicago, American Gas Association.
 Robert C. Morgan, Stewart A. Jellett Co., Heating & Piping Contractors
 National Association.

CERTIFICATION PLAN

The conference voted unanimously to indorse the operation of the certification plan by the National Bureau of Standards in connection with this commercial standard.

The certification plan as applied by the Bureau of Standards to commercial standards consists in the compilation and distribution of lists of manufacturers who are willing, when requested to do so, to certify to purchasers that products supplied by them comply with all the requirements and tests set forth in nationally recognized commercial standards. The plan is also applied to selected Federal specifications.

These lists are available on request to individual consumers, consumer groups, companies, and, in fact, to any prospective purchasers for their guidance.

The benefits now derived from the use of specifications by large consumers are thus made immediately available to the small consumer, with incidental advantage to the larger consumers of convenience in ordering and accepting material with fewer laboratory tests and of lowering the price by reason of broadening the field of supply. The manufacturer also benefits from the well-known economies accompanying "mass production."

The lists of manufacturers willing to certify to the quality of certain commodities are made by corresponding with, as nearly as possible, all the manufacturers of that product and listing only those who signify their willingness to certify to the purchaser, when requested to do so, that the commodities delivered actually comply with the commercial standard.

Obviously, the purchaser making use of the lists of willing-to-certify manufacturers will select therefrom such manufacturers as are known (or assumed) by him to be reliable.

The trend toward the purchase of materials of certified quality from sources shown on such willing to certify lists supplies added incentive to standardization on the part of other producers, and thus the benefits of the certification plan will be felt by purchasers, either directly or indirectly, whether or not they make use of the plan themselves.

COMMERCIAL STANDARDS SERVICE

Industry has long sensed the need for a wider application and use of specifications developed and approved by nationally recognized organizations. To assist these bodies and the producers and consumers in securing this result and as a natural outgrowth of the movement toward elimination of waste through simplified practice, the Bureau of Standards has set up a procedure under which specifications, properly indorsed, may be printed as official publications of the Department of Commerce and promulgated as "Commercial Standards." This service parallels that of simplified practice in many respects and is available only upon request.

Broadly speaking, the aim is to continue the same character of cooperative service in this field that is being rendered in simplification. The division of trade standards is not designed to act as a standardizing body, nor will it engage in the preparation of specifications.

Its service is mainly promotional in character, since its chief mission is to get behind a standard or a specification which any branch of industry may want to promulgate on a nation-wide basis; to determine its eligibility for promulgation; to publish and broadcast it in the event the prerequisites of procedure have been met, including a satisfactory majority acceptance; to facilitate the application of the certification plan for the assurance and convenience of the purchaser; to provide means for periodic audits of adherence; and to cooperate with the Bureau of Foreign and Domestic Commerce in determining the desire of industry relative to translation and promulgation of such specifications as a basis for foreign commerce.

In general, it may be said that a simplification covers types, sizes, and varieties of a commodity which are retained by industry on the basis of demand, whereas a commercial standard establishes definite requirements as to grade, quality, or dimensional tolerances in addition to any limitation of variety desired and accepted by the industry.

ORGANIZATION AND DUTIES OF STANDING COMMITTEE

In order to carry on the aims and desires of the industry in the standardization of their product, a standing committee is appointed at the general conference. This committee consists of members from each division of the industry; namely, producers, distributors, and consumers, and thus reflects the well-balanced viewpoint of all concerned.

The members of the committee receive all suggestions regarding the commercial standard and consider its revision in the event that such action is desirable and mutually beneficial.

If the commercial standard does not warrant revision, it is reaffirmed in its existing form, but if any important changes are found desirable, their adoption is recommended by the committee, whereupon the industry is again solicited for written acceptance of the standard in its revised form.

The committee is in effect a centralizing agency for criticisms and comments regarding the commercial standard and is charged with the responsibility of recommending revisions to keep the standard abreast with current industrial practice.

The proper functioning of the committee requires that, when necessary, its members be willing to attend meetings held at some central place, although in many cases it will be possible to conduct the work by correspondence.

When any deceptions in reference to the commercial standard are reported to the standing committee, it applies moral suasion or such other corrective measures as seem desirable. The Department of Commerce has no "police power" to compel adherence, therefore, it is incumbent upon the standing committee to do all in its power to encourage all divisions of the industry to follow the provisions of the commercial standard and contribute in every way possible to its general adoption and usefulness.

YOUR COOPERATION

As a producer, distributor, or consumer of some of the commodities for which commercial standards have already been established, you are in a position to avail yourself of the benefits arising from the use of quality standards and incidentally to add impetus to this method of eliminating waste.

The first step is a declaration in favor of the standard by recording your intention to adhere, as closely as circumstances will allow, to the standards for those products which you may buy or sell.

The receipt of your signed acceptance will permit the listing of your company in new editions of the commercial standards that you accept.

You will, of course, want to examine any commercial standards before signing a formal acceptance. The Bureau of Standards will, therefore, furnish a copy of any standard under consideration for acceptance. To facilitate this procedure, a list appears on page 12 that may be checked and mailed to the Division of Trade Standards, Bureau of Standards, Washington, D. C. The publications may also be secured singly or in quantities at a nominal price from the Government Printing Office. Prices will be furnished upon request.

The acceptance of a commercial standard is an entirely voluntary action and applies to the production, sale, and use of stock items. It is not meant to interfere with the manufacture or sale of special sizes and types sometimes required.

Trade associations and individual companies often distribute large numbers of the printed standard for the information and guidance of their members or customers. In such cases it is possible to extend the scope and degree of adherence by urging each recipient to send in an acceptance, bearing in mind that the practical value of any standardization is measured by the observance it receives.

An acceptance form for the commercial standard herein covered is included on page 9.

ACCEPTANCE OF COMMERCIAL STANDARD CS7-29

[Please sign and return this sheet to Division of Trade Standards, Bureau of Standards, Washington, D. C.]

Date.....

DIVISION OF TRADE STANDARDS,
BUREAU OF STANDARDS,
Washington, D. C.

GENTLEMEN: We, the undersigned, do hereby accept the original draft of the Commercial Standard as our standard

practice in the { production¹
distribution¹ } of Standard Weight Malleable
use¹

Iron or Steel Screwed Unions beginning,

(Date)

and will use our best effort in securing its general adoption.

To permit intelligent review of the effectiveness of the commercial standard every year by an accredited committee of all interests, working in cooperation with the Department of Commerce, we plan to supply all data, upon request, which may be necessary for the development of constructive revisions. It is understood that any suggested modifications will be submitted as soon as formulated, and shall not be promulgated until accepted in form similar to this recommendation.

Signed

(Kindly typewrite or print the following lines)

Title.....

Company.....

Street address.....

City and State.....

We are members of the following associations or other organizations interested in the production, sale, or use of Standard Weight Malleable Iron or Steel Screwed Unions:

.....
.....
.....

¹ Please designate which group you represent by drawing lines through the other two. In the case of related interests, trade papers, colleges, etc., desiring to record their general approval, the words "in principle" should be added after the signature.

TO THE ACCEPTOR

In signing the acceptance blank, please bear the following points clearly in mind:

1. *Adherence.*—The Department of Commerce has no regulatory powers to enforce adherence to the commercial standards. Instead, this waste-elimination program is based on voluntary cooperation and self-government in industry. To make this specific standardization operate as a satisfactory example of self-government, it is highly desirable that it be kept distinct from any plan or method of governmental regulation or control. It will be successful according to the degree to which manufacturers, distributors, and purchasers adhere to its terms and conditions.

2. *The industry's responsibility.*—The department cooperates only on the request of the industry and assumes no responsibility for industrial acceptance or adherence. This program was developed by the industry on its own initiative. Its success depends wholly on the active cooperation of those concerned.

3. *The acceptor's responsibility.*—You are entering into an entirely voluntary arrangement, whereby the members of the industry—the distributors and consumers of the product, and others concerned—hope to secure the benefits inherent in commercial standardization. Those responsible for this standard realize that instances may occur in which it will be necessary to supply or purchase items not included therein. The purpose is, however, to secure wider support for nationally recognized standards covering grade, quality, and other characteristics of products. Consumers can make the program a success if, in their purchasing, they will make a definite and conscientious effort to specify in terms of this commercial standard.

4. *The department's responsibility.*—The function performed by the Department of Commerce is fourfold: First, to provide a neutral agency which will insure adequate consideration of the needs of all interests; second, to supply such assistance and advice in the development of this program as past experience with similar programs may suggest; third, to solicit and record the extent of adoption and adherence to the standard; and fourth, to add all possible prestige to this standardization movement by publication and promulgation if and when it is adopted and accepted by all elements directly concerned.

REQUEST FOR COMMERCIAL STANDARDS

Date_____

DIVISION OF TRADE STANDARDS,
BUREAU OF STANDARDS,
Washington, D. C.

SIRS: The undersigned wishes to examine the commercial standards checked on the reverse side of this page, with a view toward accepting them as our standard of practice in the production, distribution, or consumption of the standardized lines.

Signed_____

(Kindly typewrite or print the following lines)

Title_____

Company_____

Street address_____

City and State_____

COMMERCIAL STANDARDS

CS. No.	Item	CS. No.	Item
1-28.	Clinical thermometers.	10-29.	Brass pipe nipples.
2-29.	Surgical gauze (preparation postponed).	11-29.	Regain of mercerized cotton yarns.
3-28.	Stoddard solvent.	12-29.	Domestic and industrial fuel oils.
4-29.	Staple porcelain (all-clay) plumbing fixtures.	13-30.	Dress patterns.
5-29.	Steel pipe nipples.	14-29.	Boys' blouses, waists, shirts and junior shirts (in preparation).
6-29.	Wrought-iron pipe nipples.	15-29.	Men's pajamas (in preparation).
7-29.	Standard weight malleable iron or steel screwed unions.	16-29.	Wall paper.
8-29.	Plain and thread plug and ring limit gage blanks (in preparation).	17-30.	Diamond core drill fittings.
9-29.	Builders' template hardware.	18-29.	Hickory golf shafts.
		19-30.	Foundry patterns of wood (in preparation),