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DEPARTMENT OF COMMERCE

BUREAU OF STANDARDS

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**UNITED STATES GOVERNMENT MASTER SPECIFICATION FOR
VITRIFIED CHINAWARE**

FEDERAL SPECIFICATIONS BOARD SPECIFICATION No. 243

This specification was officially promulgated by the Federal Specifications Board on November 5, 1924, for the use of the Departments and Independent Establishments of the Government in the purchase of vitrified chinaware.

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I. TYPES AND CLASSES

The material covered in these specifications is vitrified china of three weights known as thick china, hotel (or rolled edge) china, and medium-weight china.

II. MATERIAL AND WORKMANSHIP

Vitrified china is glazed chinaware having a white body and burned to such a temperature that a dense, practically nonabsorbent body is produced. Fracture shows a dense structure, which may appear granular. Generally, the ware will not be translucent in the thicknesses specified.

III. GENERAL REQUIREMENTS

1. **THICK WARE.**—Only three articles of this ware are described in these specifications, a cup, bowl, and individual vegetable dish. The thickness of these articles varies from five-sixteenths to three-eighths inch, and is the heavy type of ware generally used for lunch-counter service.

2. **HOTEL-WEIGHT (OR ROLLED EDGE) WARE.**—This ware has a thickness varying from five-thirty-seconds to one-fourth inch, depending upon the size of the piece, and in flatware is characterized by a "roll" or bead under the outer edge. This ware is a type used for general restaurant and hotel service.

3. **MEDIUM-WEIGHT WARE.**—This ware is somewhat lighter than rolled edge ware, and the outer edge is not rolled or beaded. It is a type generally used for hospital as well as for restaurant and hotel service.

IV. DETAIL REQUIREMENTS

1. **DESIGN.**—All ware furnished shall conform to the shapes adopted for Government use, shown in Figures 1 to 7. Measurements and weights shall be within the tolerances indicated in Lists 1 to 3. All flatware shall have a glazed foot.

2. **GRADE.**—Ware for enlisted men's service shall be run of kiln, except thirds. All other china shall be of a grade known as firsts. Ware shall be free from bad warping and imperfections in decoration.

3. **ABSORPTION.**—The average absorption of all ware having a maximum dimension of less than 10 inches shall not exceed 0.3 per cent, and no individual piece shall have an absorption greater than 0.5 per cent. The average absorption of all ware having a maximum dimension of 10 inches or more shall not exceed 1.0 per cent.

4. **IMPACT.**—Impact tests shall be made only on 8, 7, and 5 inch plates, saucers, cups, platters, and bakers. The ware shall give at least the following average and minimum values in the impact test:

ENLISTED MEN'S SERVICE

Article	Average of impact values on all samples tested	Minimum impact value on any single piece
	<i>Ft.-lb.</i>	<i>Ft.-lb.</i>
Cup.....	0.250	0.200
Coffee saucer.....	.200	.150
8-inch plate.....	.200	.150
14-inch dish, oval platter.....	.450	.400
10-inch baker.....	.450	.400
30's, bowl.....	.400	.350

HOTEL CHINA (ROLLED EDGE)

8, 7, and 5 inch plates.....	0.200	0.150
Coffee saucer.....	.200	.150
14-inch dish, oval platter.....	.450	.400
10-inch dish, oval platter.....	.350	.300
8-inch dish, oval platter.....	.250	.200
8 or 10 inch baker.....	.350	.300
Teacup.....	.080	.060

HOSPITAL SERVICE (MEDIUM WEIGHT)

8, 7, and 5 inch plates.....	0.180	0.120
Coffee saucer.....	.180	.120
10 and 12 inch dish, oval platter.....	.350	.300
10-inch baker.....	.350	.300
30's, bowl.....	.300	.250
Teacup.....	.080	.060

5. CHIPPING.—Chipping tests shall be made only on 8, 7, and 5 inch plates and on saucers. The ware shall give at least the following average and minimum values in the chipping test:

Service	Average of chipping values on all samples tested	Minimum average chipping value on any single piece
	<i>Ft.-lb.</i>	<i>Ft.-lb.</i>
Enlisted-men's service.....	0.225	0.175
Hotel china, rolled edge.....	.225	.175
Hospital service, medium weight.....	.050	.040

6. QUENCHING.—The quenching tests shall be made on plates, cups, and saucers, and on any other articles indicated by the purchasers. All samples tested shall withstand at least five quenchings without showing any crazing or cracking.

V. METHOD OF INSPECTION AND TESTS

1. SAMPLING.—(a) *Articles sampled.*—Samples for test will usually include only plates, cups, saucers, platters, and bakers, but may, at the option of the purchaser, include other articles of irregular shapes, such as gravy boats, ash trays, and jugs, which are usually ordered in

small quantities. Such shapes will be tested for absorption and quenching only.

(b) *Number of samples required.*—Samples of each shape shall be taken at random from shipments of each 100 dozen or fraction thereof for tests as follows:

Article	Test		
	Chipping	Impact	Quenching
Plates.....	3	6	3
Saucers.....	3	6	3
Cups.....		6	
Platters.....		3	
Bakers.....		3	

(c) *Marking samples.*—Separate samples shall be used for the chipping, impact, and quenching tests. Additional samples for the absorption test are not required when chipping and impact tests are specified, but six samples of the odd shapes will be required for quenching and absorption tests when specified by the purchaser. Samples for test should be so marked that the part of the shipment they represent can be identified. (See V, 3, (a), (b), and (c).)

2. METHODS OF TESTING.—(a) *Chipping test.*—This test shall be made using the apparatus and 6-ounce hammer shown in Figure 8.¹

The plate or saucer resting on its foot is placed between two cast-iron blocks forming a 90° V, so adjusted that when the hammer is hanging vertically the center of the impact face of the chipping hammer touches the edge of the test piece in the plane of the bisector of the angle of the V.

The sample is repeatedly struck on the edge by the hammer with blows of increasing force until failure occurs, beginning with the initial blow and increasing the force of each succeeding blow in the increment given below.

Service or type of ware	Weight of hammer	Initial blow	Increment
Enlisted men's service and hotel ware.....	Ounces 6	Ft.-lb. 0.10	Ft.-lb. 0.02
Hospital ware.....	6	.02	.01

Failure consists in chipping the edge so that fragments of glaze and body are removed. The article shall be tested at three equally spaced points on its periphery and the average value for the three points shall be the value for the individual article.

¹ For graduating a dial in divisions representing 0.01 ft.-lb. for use with the 6-ounce hammer, project points 0.133 inch apart, measured along the vertical axis, to the circumference of a circle whose radius is 10 inches, and for the 4-ounce hammer project points 0.2 inch apart in a similar manner.

(b) *Impact test.*—This test shall be made, using the apparatus and 4-ounce hammer as shown in Figure 8.

A plate, saucer, platter, or baker is supported against the three equally spaced one-eighth-inch steel balls, so that when the hammer is hanging vertically the impact point of the hammer touches the center of the bottom of the test piece.

A cup resting on its foot is placed between two cast-iron blocks forming a 90° V, whose sides are sufficiently high to support the upper edge of the cup, and is so adjusted that when the hammer is hanging vertically its impact point touches the cup at its upper edge and in the plane of the bisector of the angle of the V.

The samples are repeatedly struck, until failure occurs, with blows of increasing force, beginning with the initial blow and increasing the force of each succeeding blow in the increments given in the following table:

Article	Weight of hammer	Initial blow	Increment
	<i>Ounces</i>	<i>Ft.-lb.</i>	<i>Ft.-lb.</i>
Plate, saucer, platter, baker.....	4	0.10	0.02
Enlisted men's service cup.....	4	.10	.02
Teacup.....	4	.02	.01

Failure of plates, saucers, platters, and bakers is defined as the development of a rupture which appears as a hole through the body or as a body crack extending through the rim of the article. Failure of cups is defined as the development of a body crack extending into any portion of the foot or as the breaking away of a portion of the body.

(c) *Quenching test.*—The article to be tested is heated to a uniform temperature of 175° C. for 15 minutes, preferably in an electric oven, and quickly plunged into water at approximately 20° C. The development of crazes or cracks of any kind shall constitute failure.

(d) *Absorption test.*—Absorption shall be made on glazed pieces having an area of approximately 2½ square inches, broken from three different samples used in the chipping or impact tests. The samples, after being dried to constant weight at 110° C., shall be completely immersed and vigorously boiled in water for 5 hours and then allowed to remain in the water for 20 hours. The samples are then removed, wiped with a damp cloth to remove excess moisture and immediately weighed to the nearest 0.01 g. The percentage of absorption is computed from the formula:

$$\text{Percentage absorption} = \frac{\text{Wet weight} - \text{dry weight}}{\text{Dry weight}} \times 100$$

3. ACCEPTANCE AND REJECTION.—(a) *Failure of one type only.*—Failure of any type of article to conform to any of the requirements of these specifications shall cause rejection of that type. If any one type of article, such as plates or saucers, meets the requirements, but another type, such as cups, fails to comply with these requirements, that portion of the shipment which conforms shall be accepted and the portion failing to conform shall be rejected.

(b) *Failure of portion of samples of same type.*—Also, if the sample representing one part of a shipment of ware of the same type of article fail to meet the requirements, and samples representing other parts of the same shipment conform to the requirements of these specifications, only that part of the shipment represented by the samples that fail to meet the requirements of the specifications shall be rejected.

(c) *Retest.*—If the first set of samples does not meet the requirements of these specifications the manufacturer may, within 10 days after notification, demand a retest which must be made on a second set of samples taken from the shipment in question. If the test on the second set of samples is satisfactory, the material shall be accepted.

VI. METHOD OF MARKING

Ware shall be marked on the bottom in underglaze figures showing the manufacturer's name and contract year as indicated on order.

VII. ADDITIONAL INFORMATION

No details.

VIII. GENERAL SPECIFICATIONS

No details.

SPECIFICATION FOR VITRIFIED CHINAWARE

LIST 1.—Hotel-weight china for dining-room service¹

Figure	Number of piece	Article	Trade size	Actual size	Tolerance	Maximum weight
1	1	Soup plate	7-inch, RE	9 inches	1/8 inch	Lbs. 24
4	36	Plates	4-inch, RE	6 1/4 inches	1/8 inch	9
1	4	do	5-inch, RE	7 1/4 inches	1/8 inch	12 1/2
1	3	do	7-inch, RE	9 inches	1/8 inch	24
1	2	do	8-inch, RE	9 5/8 inches	1/8 inch	27
1	6	Soup rim, deep	5-inch, RE	7 inches	1/8 inch	12
1	10	Tea saucer, wide foot	RE	6 1/8 inches	1/8 inch	9 1/2
1	11	Coffee saucer (after dinner)	RE	4 7/8 inches	1/8 inch	5 1/2
1	9	Coffee cup, Saxon (after dinner)		3 1/2 ounces	1/4 ounce	5
1	8	Teacup, Boston		7 1/2 ounces	1/2 ounce	7
1	7	Bouillon cup, Boston	No. 2, BH	7 1/2 ounces	1/2 ounce	7 1/2
1	12	Egg cup, wheat, unhandled.		6 1/2 ounces	1/2 ounce	10
1	15	Baker	8-inch, RE	10 inches	1/4 inch	29
4	40	do	10-inch, RE	11 1/8 inches	3/8 inch	3 0
1	14	do	5-inch, RE	7 1/4 inches	1/8 inch	12 1/2
4	39	do	3-inch, RE	5 3/4 inches	1/8 inch	7
1	17	Salad bowl	No. 3, RE	9 1/2 inches	1/4 inch	2 8
1	5	do	No. 6, RE	6 inches	1/4 inch	15
2	18	Sauce boat	Large, RE	11 ounces	1 ounce	18
2	19	Celery (pickle)	No. 3	7 1/2 inches	1/8 inch	8 1/2
2	24	Pin tray		5 1/4 inches	1/8 inch	5
2	22	Cream tankard 2	Handled or unhandled.	1 1/2 ounces	1/4 ounce	6
2	23	Cream jug, handled, 1	5 1/2, medium	4 1/2 ounces	1/2 ounce	6
2	29	Sugar, individual, covered	RD unhandled	5 ounces	1/4 ounce	8
2	30	Sugar	No. 1 RE	17 ounces	1 1/2 ounce	28
2	26	Butter, individual	2 1/2-inch, RE	3 1/2 inches	1/8 inch	3
2	20	Mustard, unhandled	Vienna No. 1	4 ounces	1/2 ounce	11
2	27	Cake cover, plain		6 1/4 inches	1/8 inch	19
2	21	Jug, hall boy	2 1/2's	2 3/4 pints	1/2 pint	2 12
2	25	Jug	6's, RE	6 pints	3/4 pint	5 0
2	25	do	12's, RE	4 1/2 pints	1/2 pint	4 0
2	25	do	24's, RE	3 1/2 pints	3/8 pint	2 8
2	25	do	36's, RE	1 1/4 pints	1/4 pint	22
2	25	do	42's, RE	3/4 pint	1/8 pint	17
2	25	do	48's, RE	5 1/2 ounces	3/4 ounce	9
4	35	Dish, oval, platter	4-inch, RE	7 inches	1/8 inch	9 1/2
3	34	do	6-inch, RE	9 1/8 inches	1/8 inch	16
3	33	do	8-inch, RE	11 1/4 inches	1/4 inch	27
3	32	do	10-inch, RE	13 1/4 inches	1/4 inch	2 10
3	31	do	14-inch, RE	17 1/2 inches	1/2 inch	6 0
1	16	Casserole, plain	8-inch, RD	2 3/4 pints	1/4 pint	2 8
4	38	Match stands, round	Hooded	6 1/2 inches	1/2 inch	12
4	37	Ice tub		9 1/4 pints	1 pint	8 0
1	13	Fruit (sauce dish)	4-inch, RE	5 3/8 inches	1/8 inch	6 1/2

¹ The ware described in this list is, in general, that specified for the Public Health Service, the Veterans' Bureau, Navy Officers mess, and the General Supply Committee.

LIST 2.—*Thick china for enlisted men's service*¹

Figure	Number of piece	Article	Trade size	Actual size	Tolerance	Maximum weight
						<i>Lbs. ozs.</i>
5	4	Cup, unhandled	13 ounces	3¾ inches	¼ inch	20½
5	5	Saucer, coffee		7 inches	¼ inch	13
5	6	Fruit	4-inch, RE	5¾ inches	¼ inch	6½
5	2	Plate	8-inch, RE	9¾ inches	¼ inch	27
5	3	Soup, rim, deep	7-inch, RE	9 inches	¼ inch	24
5	8	Baker	10-inch, RE	11¼ inches	¾ inch	3 0
5	9	do	2½-inch, DT	5½ inches	¼ inch	8½
5	10	Bowl	30's, low-foot	5¾ inches	¼ inch	22
5	14	Butter, individual	2½-inch, RE	3¼ inches	¼ inch	3
5	15	Pickle	No. 2 club celery	9¾ inches	¼ inch	16
5	12	Sauce boat	Cable	13 ounces	1 ounce	28
5	13	Sugar	No. 1, RE	17 ounces	1½ ounces	28
5	11	Mustard, unhandled	Large	6½ ounces	½ ounce	13½
5	1	Dish (platter)	14-inch, RE	17½ inches	¼ inch	6 0
5	7	Jug	5's, RE	8 pints	1 pint	6 0

¹ The ware described in this list is, in general, that specified for the Army, Navy, and General Supply Committee.

LIST 3.—*Medium-weight vitrified china for hospital service*¹

Figure	Number of piece	Article	Trade size	Actual size	Tolerance	Maximum weight
						<i>Lbs. ozs.</i>
6	1	Plate, dinner	7 inches	9 inches	¼ inch	21
6	2	Plate, bread and butter	4 inches	6¼ inches	¼ inch	8½
6	3	Plate, pie	5 inches	7½ inches	¼ inch	11
7	21	Dishes, platter	10 inches	13¼ inches	¼ inch	2 9
7	20	do	12 inches	15½ inches	¼ inch	3 8
6	4	Bowl	30's, low-foot	5¾ inches	¼ inch	19
6	5	Celery, pickle	No. 3	7½ inches	¼ inch	8½
6	6	Cup, tea, Boston, Bk. handled.		7½ ounces	½ ounce	7
6	7	Saucer, tea, reinforced well hole		5¾ inches	¼ inch	7½
6	8	Bakers, open vegetable dish.	8 inches	10½ inches	¼ inch	2 0
6	9	Sauce boat, gravy, large		11 ounces	1 ounce	18
6	10	Fruits, sauce dish	4 inches	5¾ inches	¼ inch	6
6	11	Mustard, unhandled	Vienna No. 1	4 ounces	½ ounce	11
7	13	Cream, Vienna, unhandled.		1¾ ounces	¼ ounce	5½
6	12	Jug, pitcher	5's, RE	8 pints	1 pint	6 0
7	14	Jug, handled	54's	4½ ounces	½ ounce	6
7	14	do	36's	1¾ pints	¼ pint	18
7	15	Sugar bowl, individual	RD covered, unhandled.	5 ounces	¼ ounce	8
6	16	Egg cup, double		4 ounces	¼ ounce	7
7	22	Bakers, individual vegetable.	3 inches	5¾ inches	¼ inch	7½
6	17	Bowl, oatmeal, cereal		6 inches	¼ inch	9
6	18	Sugar bowl	No. 1, RE	17 ounces	1½ ounces	28
6	19	Coffee pot, individual		12 ounces	1 ounce	15

¹ The ware described in this list is, in general, that specified for the Medical Corps.

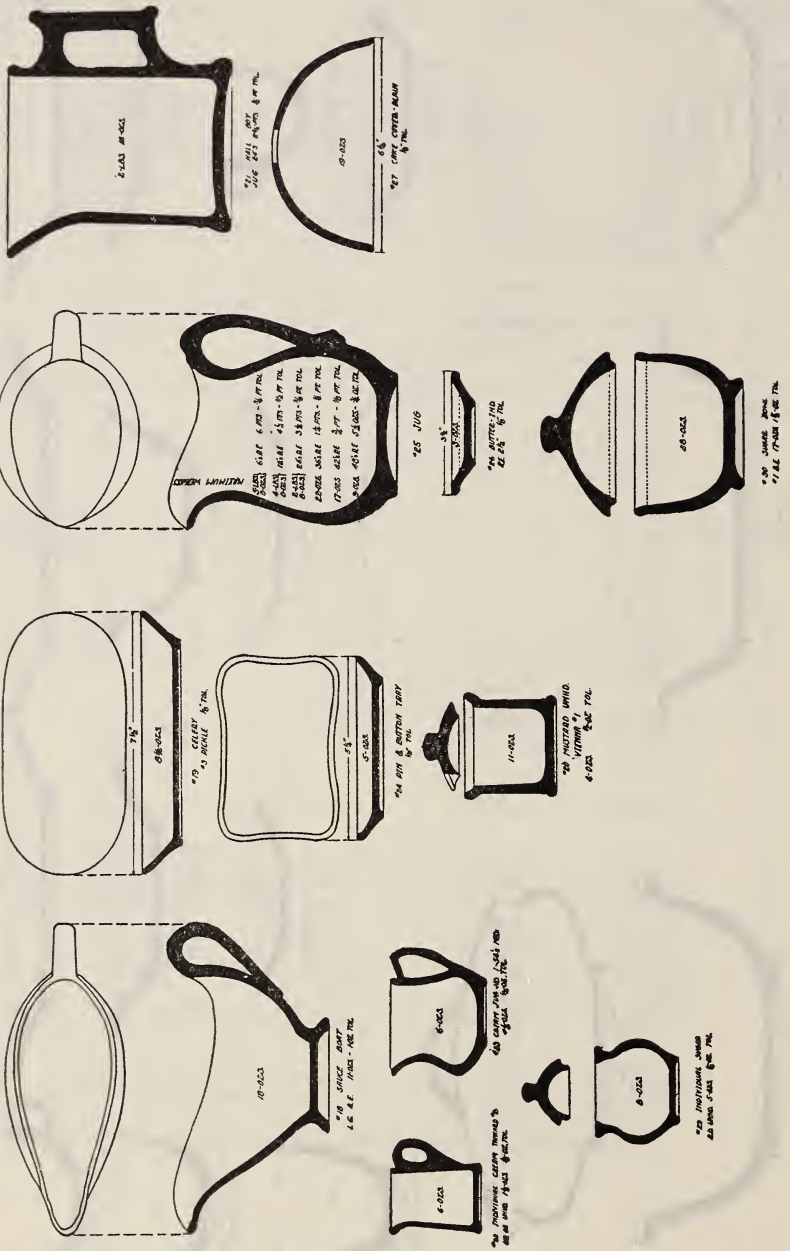


Fig. 2

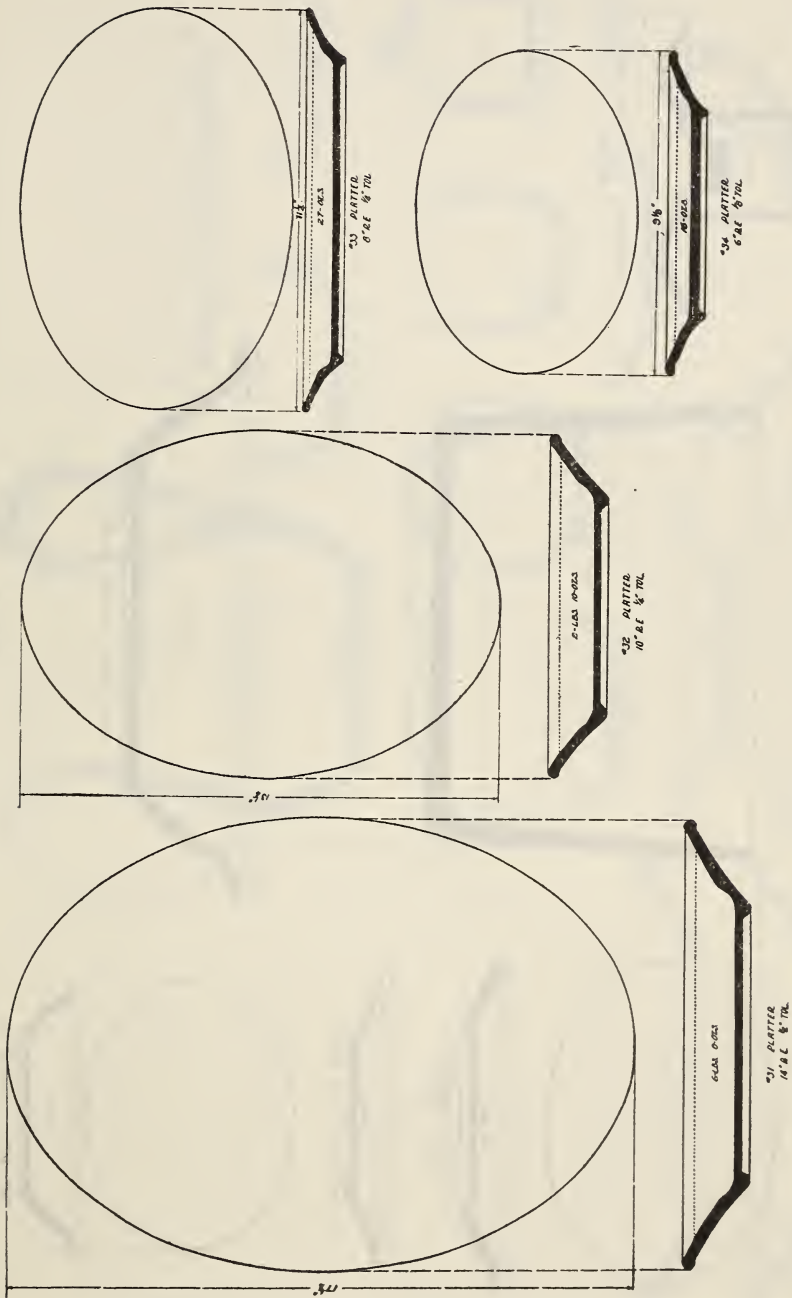


FIG. 3

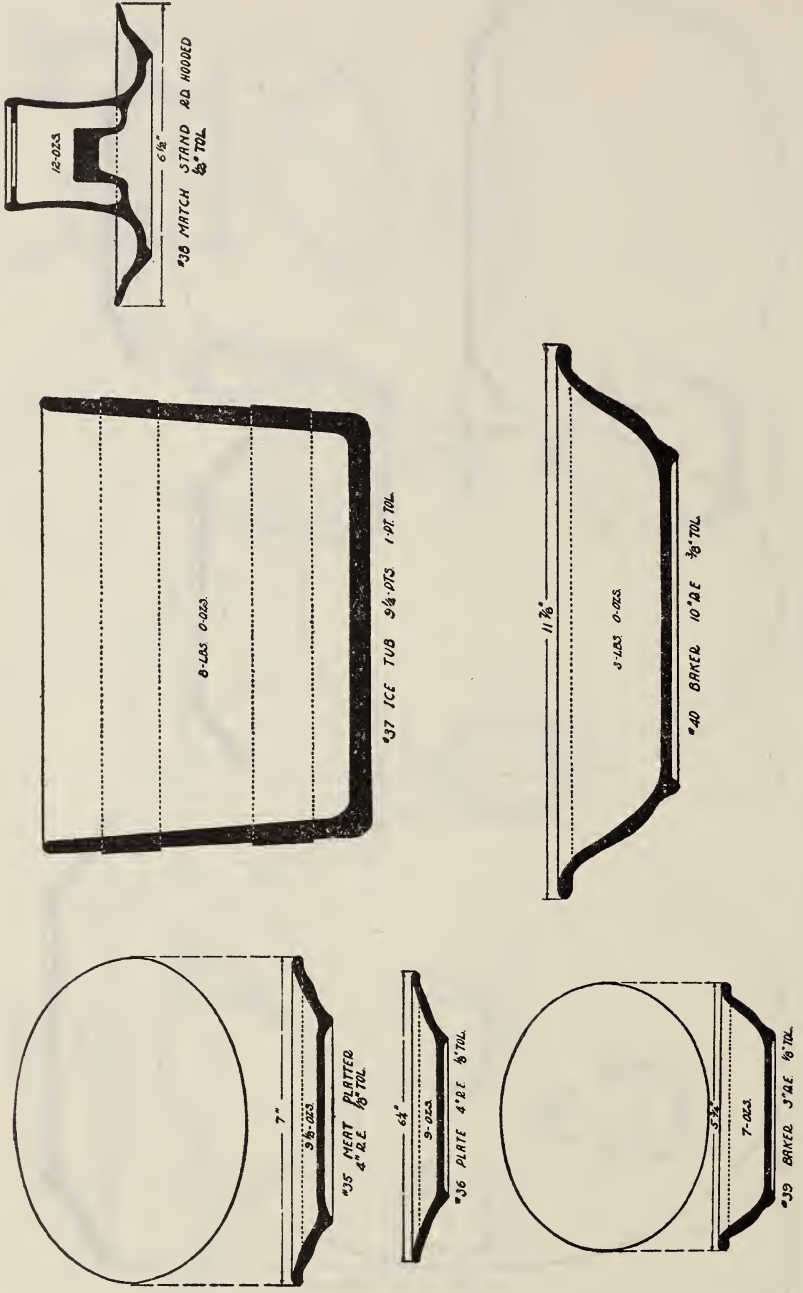


FIG. 4

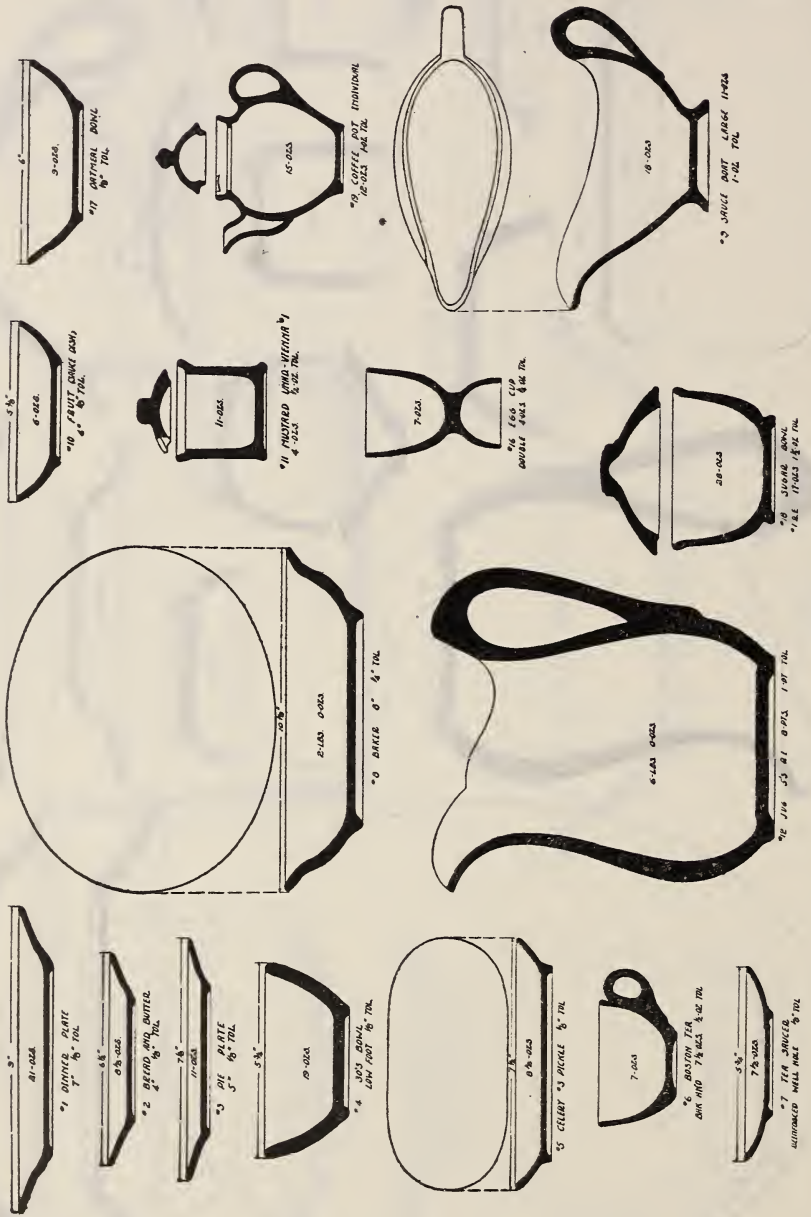


Fig. 6

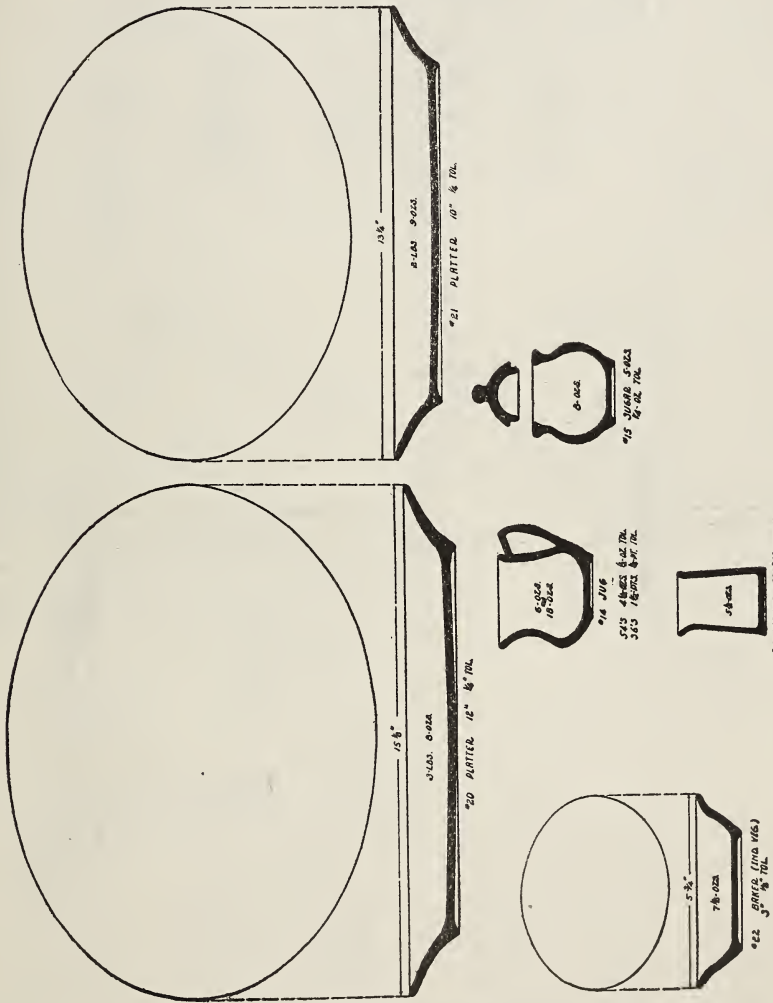


FIG. 7

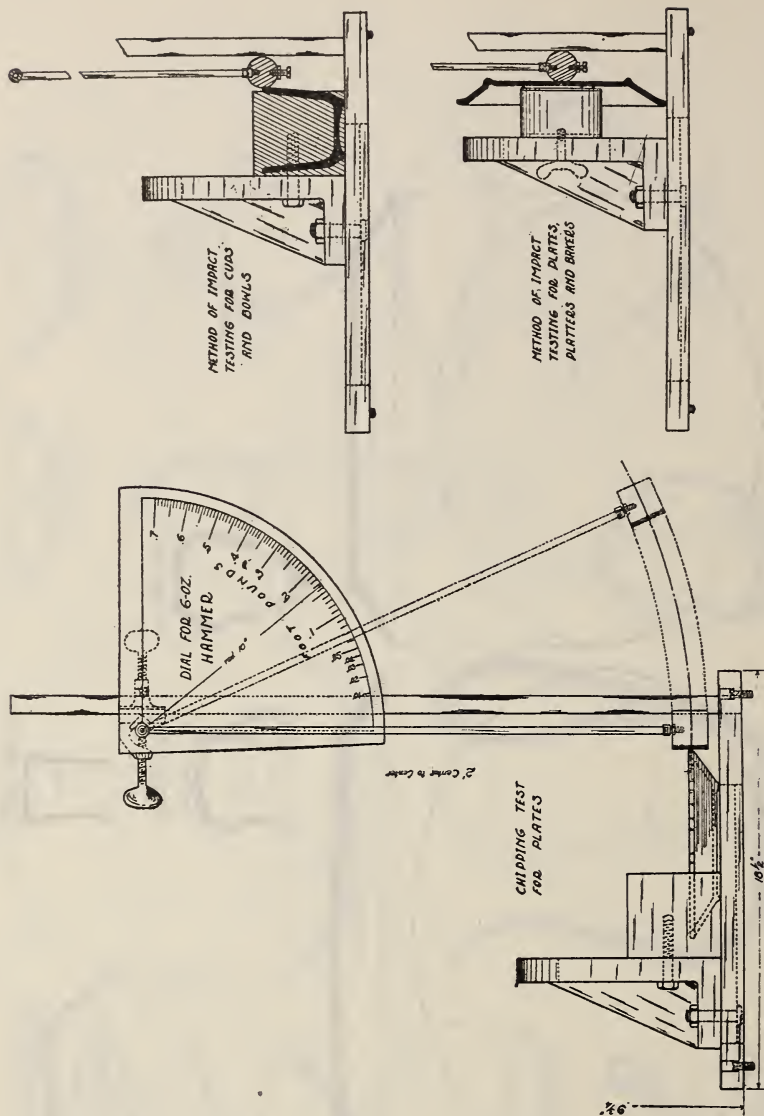


Fig. 8.—Apparatus for impact and chipping test

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