

U. S. DEPARTMENT OF COMMERCE
JESSE H. JONES, Secretary
NATIONAL BUREAU OF STANDARDS
LYMAN J. BRIGGS, Director

STAPLE VITREOUS CHINA PLUMBING FIXTURES

(THIRD EDITION)

COMMERCIAL STANDARD CS20-42

[Supersedes CS20-36]

Effective Date for New Production from July 10, 1942



A RECORDED VOLUNTARY STANDARD
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PROMULGATION
of
COMMERCIAL STANDARD CS20-42
for
STAPLE VITREOUS CHINA PLUMBING FIXTURES
(Third Edition)

On September 25, 1929, the Manufacturers' Advisory Committee on Vitreous China Plumbing Fixtures, with the approval of the standing committee, adopted a commercial standard for staple vitreous china plumbing fixtures, which was subsequently accepted by the industry and promulgated as Staple Vitreous China Plumbing Fixtures, Commercial Standard CS20-30 (first revision of Simplified Practice Recommendation R52). In 1936, with the endorsement of the standing committee, a revision was adopted and issued as CS20-36.

On May 4, 1942, with the endorsement of the standing committee, a revision drafted by the Vitreous China Plumbing Fixtures Association, which included several additional items and tests, was circulated for acceptance. Those concerned have since accepted and approved for promulgation by the United States Department of Commerce, through the National Bureau of Standards, the revised standard as shown herein.

The revised standard is effective for new production from July 10, 1942.

Promulgation recommended.

I. J. Fairchild,
Chief, Division of Trade Standards.

Promulgated.

Lyman J. Briggs,
Director, National Bureau of Standards.

Promulgation approved.

Jesse H. Jones,
Secretary of Commerce.

STAPLE VITREOUS CHINA PLUMBING FIXTURES

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GENERAL REQUIREMENTS

1. The nomenclature, definitions, and grading rules given herein are standard for all vitreous china plumbing fixtures.

2. Dimensions and general practices given herein are standard for staple vitreous china plumbing fixtures as listed herein. The line drawings herein contained are only for the purpose of showing dimensions and are not to indicate designs.

3. The vitreous china material used for plumbing fixtures listed herein shall meet the requirements of the absorption and crazing tests specified in paragraphs 38 and 39.

4. Glazed surfaces shall be thoroughly fused and united to the fixture body. All visible surfaces shall be glazed except those coming in contact with walls or floors. On lavatories set away from walls, those portions of the rear aprons used for supporting the fixtures in kilns, and also the back of overflows and underside of outlet boss, may be without glaze. The underside of water-closet tanks and lids need not be glazed. Other fixtures not mentioned herein may have unglazed portions at points where fixtures are supported in the kilns but such unglazed surfaces must be in positions that are not visible when installed in the normal manner.

5. Types and sizes of water-closet bowls, tanks, lavatories, urinals, service sinks, and other vitreous china plumbing fixtures not specifically mentioned are not classed as staple.

GRADING RULES

6. Vitreous china plumbing fixtures shall be graded in accordance with the grading rules as given herein.

7. The terms "first quality" and "culls" shall be used for grading vitreous china plumbing fixtures.

8. Careful inspection is employed in each department of manufacture and each of the imperfections listed herein as acceptable under the "first quality" grading is caused by some unavoidable condition in the manufacturing process. Perfection is not guaranteed nor is it commercially possible.

9. The blemishes permitted under the grading rules do not affect the utility value of the fixture or make it unsafe from a health or sanitary point of view.

10. It is not intended that inspectors shall measure or count any blemishes except in case of doubt, since, with practice, dimensional limits and numbers can be readily gaged by eye.

METHOD OF GRADING

11. Water-closet bowls are normally examined for minor blemishes with the eyes of the observer about 2 feet directly above the rim while the fixture is rocked to either side and backward to an angle of about 45 degrees. Minor blemishes not observed in this operation are assumed to be on unseen surfaces.

12. Water-closet bowls, urinals, high tanks, service sinks and all pedestals and legs are graded in accordance with the maximum blemishes listed in table 1.

13. Low tanks are graded in accordance with the maximum blemishes listed in table 2. Examinations should be made with the eyes of the observer about 2 feet from the surface observed. No blemishes on the inside surface are counted. Minor blemishes on the outside surface, hidden by the cover, are not counted.

TABLE 1.—Maximum blemishes for water-closet bowls, urinals, high tanks, service sinks, and all pedestals and legs

Location	Blemish or defect	Maximum permitted
General	Dull or eggshell finish.....	Not over 4 square inches.
	Wavy finish.....	Not more than 4 square inches.
	Excess glaze.....	Not more than 1/8 inch thick in well.
	Warpage:	
	Water closets.....	Not noticeably warped when seat is attached.
	Other fixtures.....	Not more than 1/4 inch per foot; total warpage not more than 1/2 inch.
Flushing surface	Large blisters.....	Not more than two.
	Dunts.....	None allowed.
	Projections.....	Do.
	Exposed body.....	None allowed.
	Fire check.....	Do.
Visible surface	Spots, blisters, and pinholes.....	No segregation; a total of not over 10.
	Bubbles or specks.....	Not over 10 in 1 "pottery square"; a total of not over 25.
Visible surface	Exposed body.....	Not over 1/4 inch on foot; not over 1/8 inch on more prominent surfaces (maximum dimension).
	Fire check.....	Not over 1/4 inch long.
	Spots, blisters, and pinholes.....	No segregation; a total of not over 10.
	Bubbles or specks.....	Not over five in one "pottery square"; a total of not over 25.

TABLE 2.—Maximum blemishes for low tanks and covers

Location	Blemish or defect	Maximum permitted
General.....	{Warpage.....	Not noticeably warped. None allowed.
	{Dunts.....	
Visible surface.....	{Dull or eggshell finish.....	None allowed on front; not over 2 square inches on each side.
	{Wavy finish.....	
	{Exposed body.....	Not more than 4 square inches.
	{Fire check.....	Not over 1/8 inch (maximum dimension).
	{Spots, blisters, and pinholes.....	None on front, one each side not over 1/4 inch long.
	{Bubbles or specks.....	No segregation; a total of not over 10. Not over five in one "pottery square"; a total of not over 25.

14. Covers shall show not more than 50 percent of the number of blemishes listed in table 2.

15. Lavatories are graded in accordance with the maximum number of blemishes listed in table 3. Lavatories should be examined with the eyes of the observer about 2 feet from the surface observed. (Pedestals and legs are graded the same as water-closet bowls.)

16. All vitreous china plumbing fixtures not specifically mentioned in the foregoing shall take the grading rules for water-closet bowls.

TABLE 3.—Maximum blemishes for lavatories

Location	Blemish or defect	Maximum permitted
General.....	{Dunts.....	None allowed. Do. Warpage of slab out of horizontal plane not to exceed 1/4 inch on all sizes. (The same allowable deviation to apply to lavatories with back, when attached to wall.)
	{Craze.....	
	{Warpage.....	
Service space, top of slab, inside of bowl and front of apron.	{Dull or eggshell finish.....	One allowed, not over 1/2 inch.
	{Exposed body.....	
	{Fire check.....	None allowed.
	{Spots, blisters, and pinholes.....	Do.
	{Bubbles and specks.....	No segregation; a total of not more than four.
	{Polishing mark.....	Do. Not more than two allowed.
Face of integral back and sides.	{Dull or eggshell finish.....	One allowed, not over 1/2 inch.
	{Exposed body.....	
	{Large blisters.....	None over 1/2 inch, not more than two allowed.
	{Fire check.....	Not more than two on either side or on back; a total of not more than three.
	{Spots, blisters, and pinholes.....	None on back; one only allowed, which may be on either side.
	{Bubbles or specks.....	Not more than three on back or on either side, a total of not more than six. No segregation; a total of not more than six.

DETAIL REQUIREMENTS

ALL FIXTURES

17. Vitreous china shall not be less than 1/4 inch thick at any point; shall average not less than 3/8 inch thick, except in flush rims and parts forming overflows.

18. Variations from specified dimensions of not more than 5 percent plus or minus will be allowed except where minimum and maximum limits are specified.

19. The depth of seal of integral traps in all vitreous china plumbing fixtures shall be 2-inch minimum, except where greater depths are herein specifically required.

WATER-CLOSET BOWLS

20. *Flushing.*—Water-closet bowls covered by these standards shall pass the flushing test specified in paragraph 40 in order to be considered as having a satisfactory flushing action.

21. *Spud size.*—The standard size for spuds on all water-closet bowls shall be as follows:

2 inches for all water-closet bowls operated under low tanks.

1½ inches for all water-closet bowls operated under high tanks or direct flushing valves.

22. *Outlets.*—The outlets of water-closet bowls shall conform to dimensions shown in figure 1.

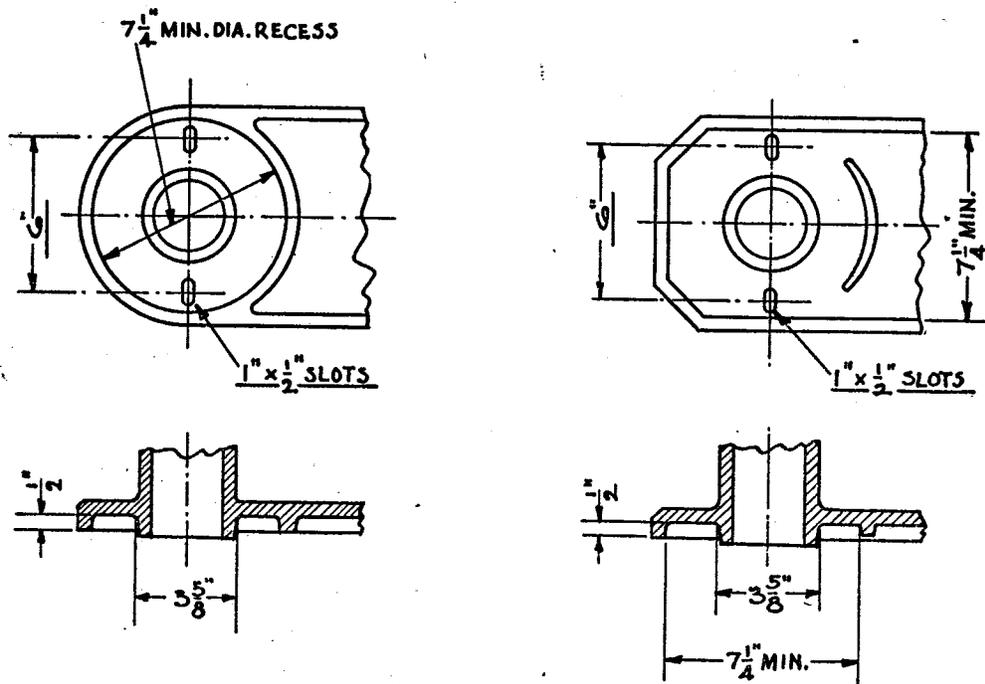


FIGURE 1.—Outlet—Water-closet bowls.

Design of base may vary from that shown.

23. “*Juvenile*” height water-closet bowls shall be 13 inches minimum, 14 inches maximum from floor to top of rim, and shall have the same top contour as regular bowls (smaller or “baby” bowls are considered special).

24. *Combinations.*—The following water-closet combinations shall be considered staple. Classes of water-closet combinations shall be further clarified by designating type of water-closet bowl involved as “Direct flushing valve siphon jet water-closet combination” or “Direct flushing valve reverse trap water-closet combination.”

24a. Close-coupled water-closet combination.—“Water-closet bowl” with separate tank which is secured to and supported by the “water-closet bowl.”

24b. Direct-flushing-valve water-closet combination.—“Water-closet bowl” with direct flushing valve.

24c. High-tank water-closet combination.—“Water-closet bowl” with separately supported “high tank.”

24d. Integral water-closet combination.—Single piece of china comprising “water-closet bowl” and tank.

24e. Low-tank water-closet combination.—“Water-closet bowl” and low separately supported tank, the bottom of which is mounted

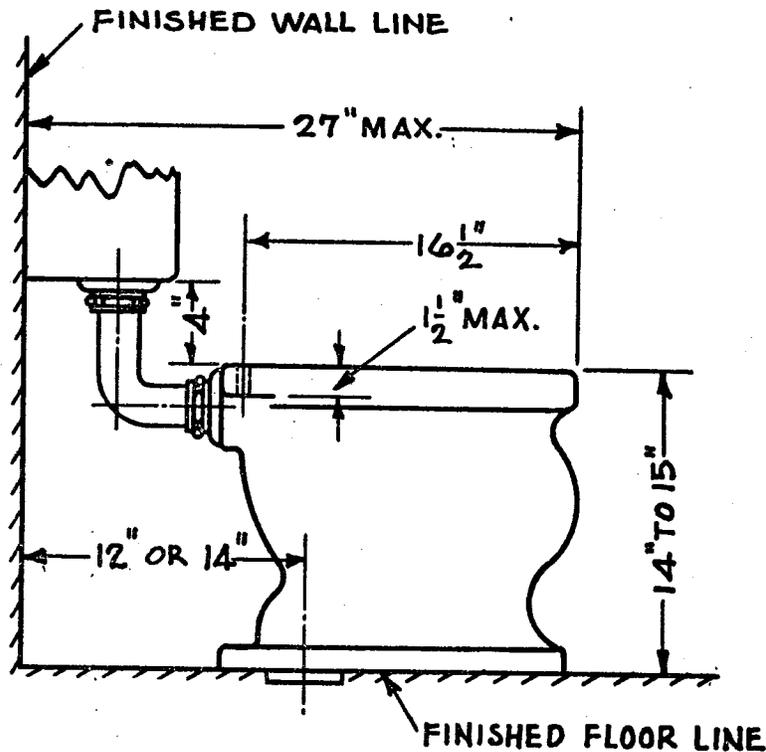
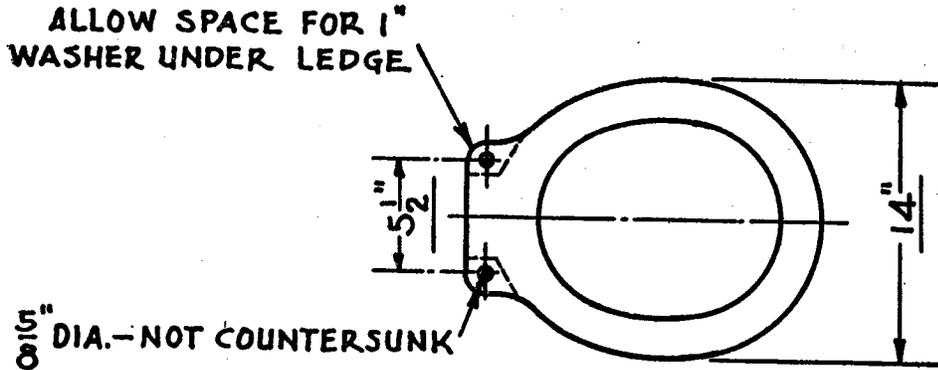


FIGURE 2.—Low tank wash-down water-closet combination.

with respect to the water-closet bowl approximately as indicated in figure 2 herein. (See also figs. 4 and 7.)

25. Washdown water-closet bowl.—The term “washdown” shall be applied to water-closet bowl having back supply (except for use as part of integral or close-coupled combination); integral flushing rim and jet; a minimum water surface of 8 x 7 inches; a minimum water seal of 2 1/2 inches; a siphon trapway at the front of closet which shall pass a 1 1/2 inches diameter solid ball. Minimum weight of back

supply bowl 31 pounds; minimum weight close-coupled bowl 35 pounds. Shall be as shown in figures 2 and 3.

26. *Reverse trap water-closet bowl.*—The term "reverse trap" shall be applied to water-closet bowls having back supply (except for use as part of integral or close-coupled combinations); integral flushing rim and jet; a minimum water surface of $8\frac{3}{4} \times 7\frac{1}{2}$ inches; a minimum water seal of $2\frac{1}{2}$ inches; a siphon trap at the rear of closet which shall pass a $1\frac{1}{2}$ inches diameter solid ball. Minimum weight of back supply bowl 36 pounds; minimum weight close-coupled bowl 40 pounds; minimum weight of integral combination less cover 70 pounds. Shall be as shown in figures 4, 5, and 6.

27. *Siphon jet water-closet bowl.*—The term "siphon jet" shall be applied to the water-closet bowl having top supply (except for use as part of close-coupled combination); integral flushing rim and jet; a minimum water surface of 12×10 inches; a minimum depth of seal of 3 inches; a siphon trapway at the rear of closet which shall pass a $2\frac{1}{8}$ inches diameter solid ball. Minimum weight regular top supply bowl 46 pounds; minimum weight close-coupled bowl 48 pounds; minimum-weight juvenile-height bowl 42 pounds. Shall be as shown in figures 7 and 8.

28. *Blow-out wall hanging water-closet bowls.*—The term "blow-out wall hanging" shall be applied to wall closet bowls having top supply; integral flushing rim and jet; a minimum water surface of 12×10 inches; a minimum depth of seal of 3 inches; a trapway which shall pass a $2\frac{1}{8}$ inches diameter solid ball. Minimum weight 43 pounds. Shall be as shown in figure 9.

29. *Siphon jet wall-hanging water-closet bowl.*—The term "siphon jet wall-hanging" shall be applied to wall closet bowl having top supply; integral flushing rim and jet, a minimum water surface of 12×10 inches; a minimum depth of seal of 3 inches; a siphon trapway which shall pass a $2\frac{1}{8}$ inches diameter solid ball. Minimum weight 48 pounds. Shall be as shown in figure 10.

TANKS

30. Staple low wall-hanging tanks shall be designated as either "18-inch low tanks" or "20-inch low tanks," according to inside top dimension of the tank. Shall be as shown in figure 11.

NOTE.—The following shall be furnished with "trimmed" staple low wall-hanging tanks:

- 1—Float valve (Ball Cock) with refill tube and float ball rod.
- 1—Float.
- 1—Tank flush valve (Douglas pattern) with $2\frac{1}{2}$ -inch rubber ball and 1-inch O. D. minimum overflow tube and $11\frac{1}{4}$ inches high, measured from inside bottom of tank.
- 1—Single or double acting operating lever.
- 1—2-inch O. D. elbow flush connection 5×6 inches maximum complete with nuts and rubber washers, or
- 1— 2×6 -inch straight or offset flush connection with nuts and rubber washers.
- 2—Wood screws with washers or hooks for tank.

NOTE.—The following items are optional according to understanding between buyer and seller:

- 1— $\frac{3}{8}$ -inch escutcheon, for supply pipe, when furnished.
- 1—2-inch spud escutcheon, where required.
- 1—Supply pipe not less than 14 B&S gage (0.064 inch) wall thickness with $\frac{3}{8}$ -inch American Standard Tapered Pipe Threads on inlet end:
 - 19 inches long for tank with back supply bowls.
 - 21 inches long for tank with top supply bowls.

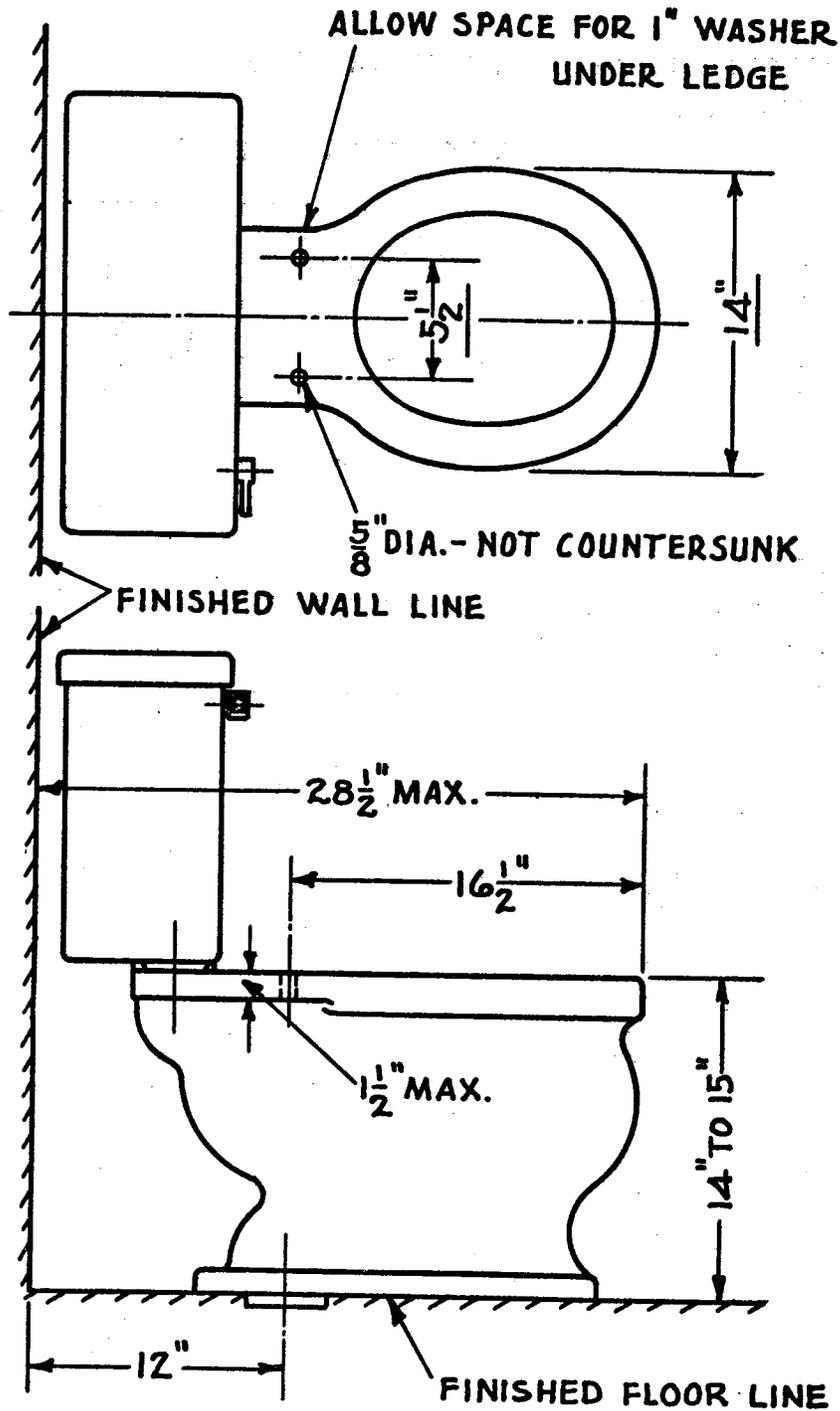


FIGURE 3.—Close-coupled wash-down water-closet combination.

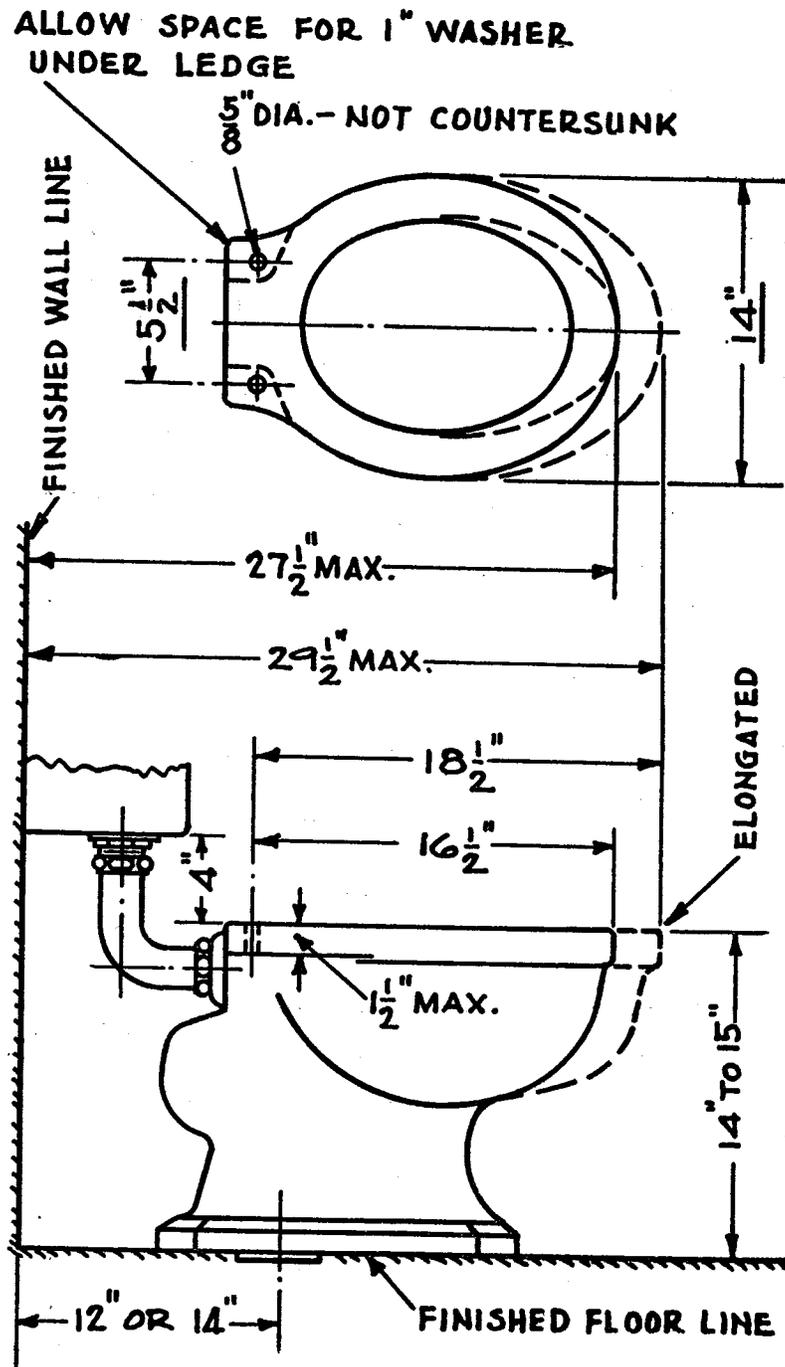


FIGURE 4.—Low tank-reverse trap-water closet combination.

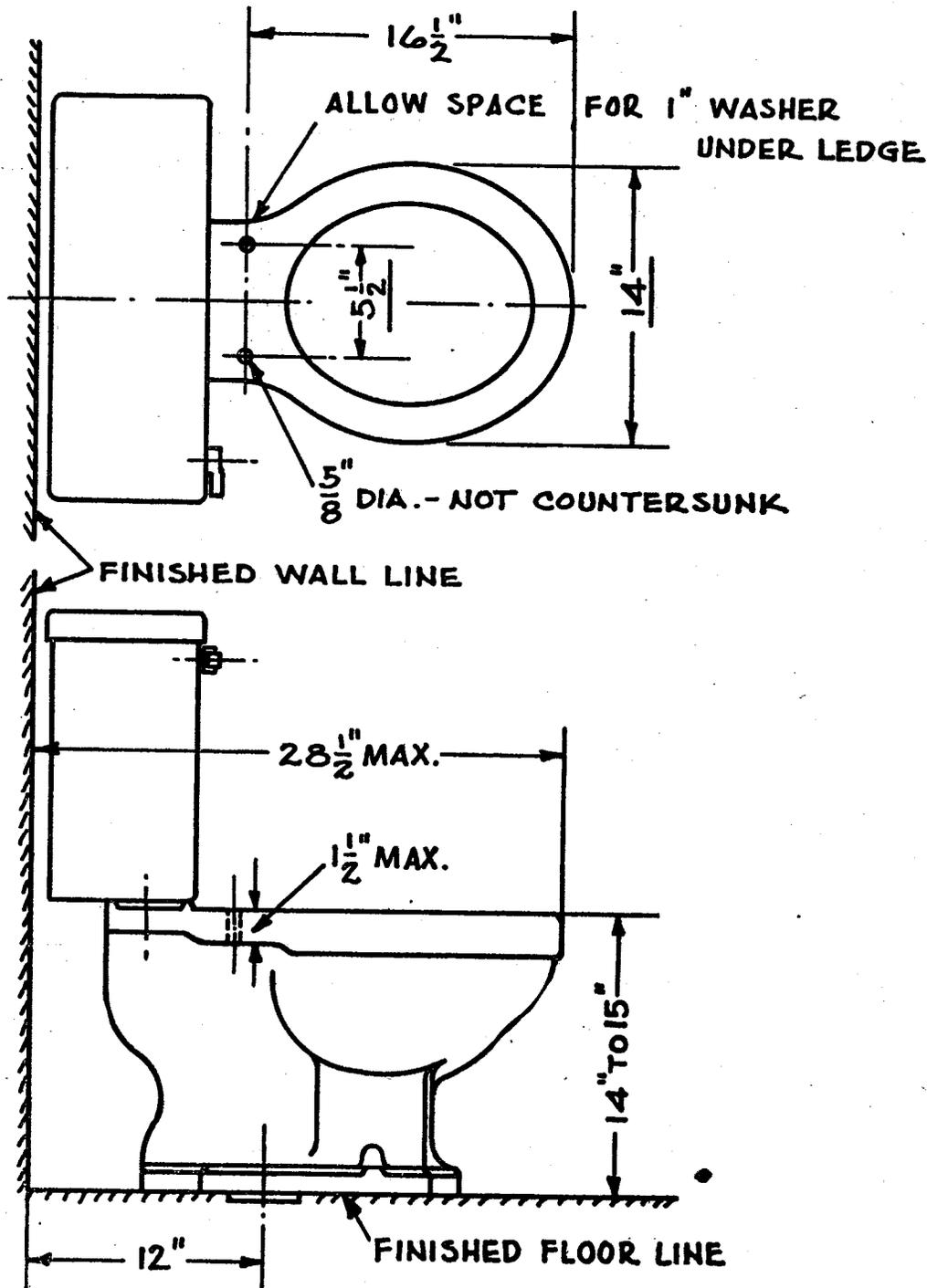


FIGURE 5.—Close-coupled reverse trap water-closet combination.

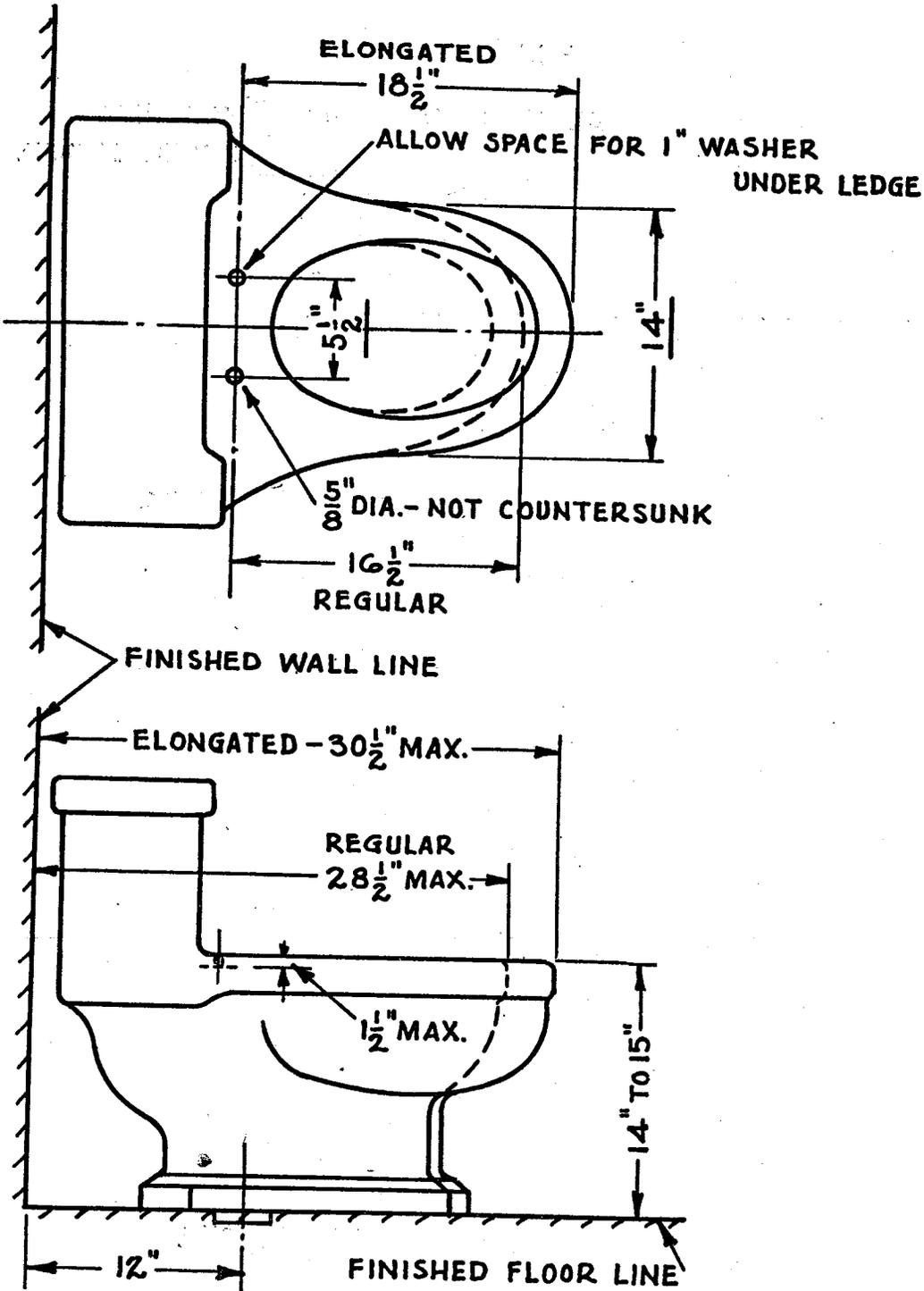


FIGURE 6.—Integral reverse-trap water-closet combination.

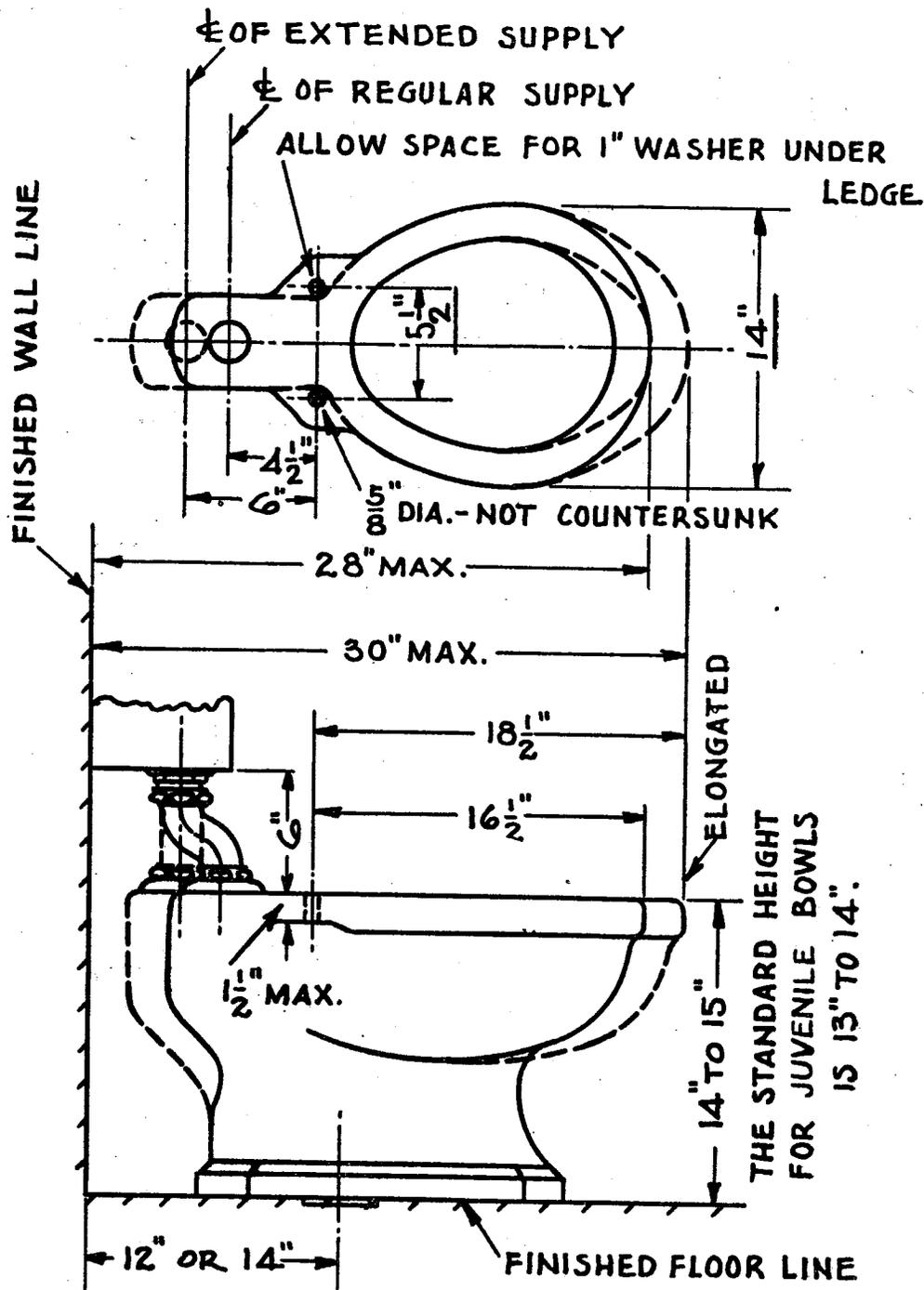


FIGURE 7.—Low-tank siphon-jet water-closet combination.

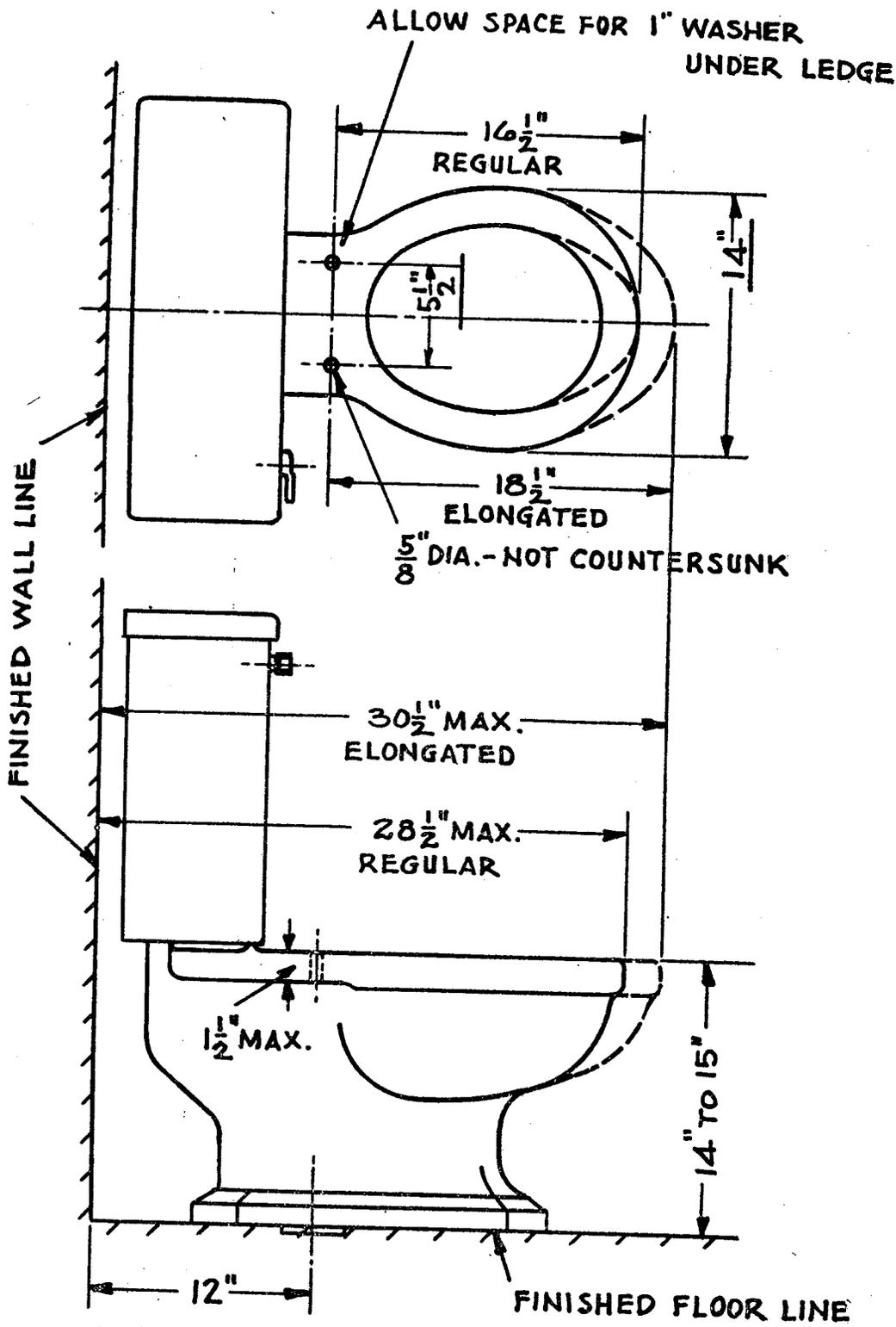


FIGURE 8.—Close-coupled siphon-jet water-closet combination.

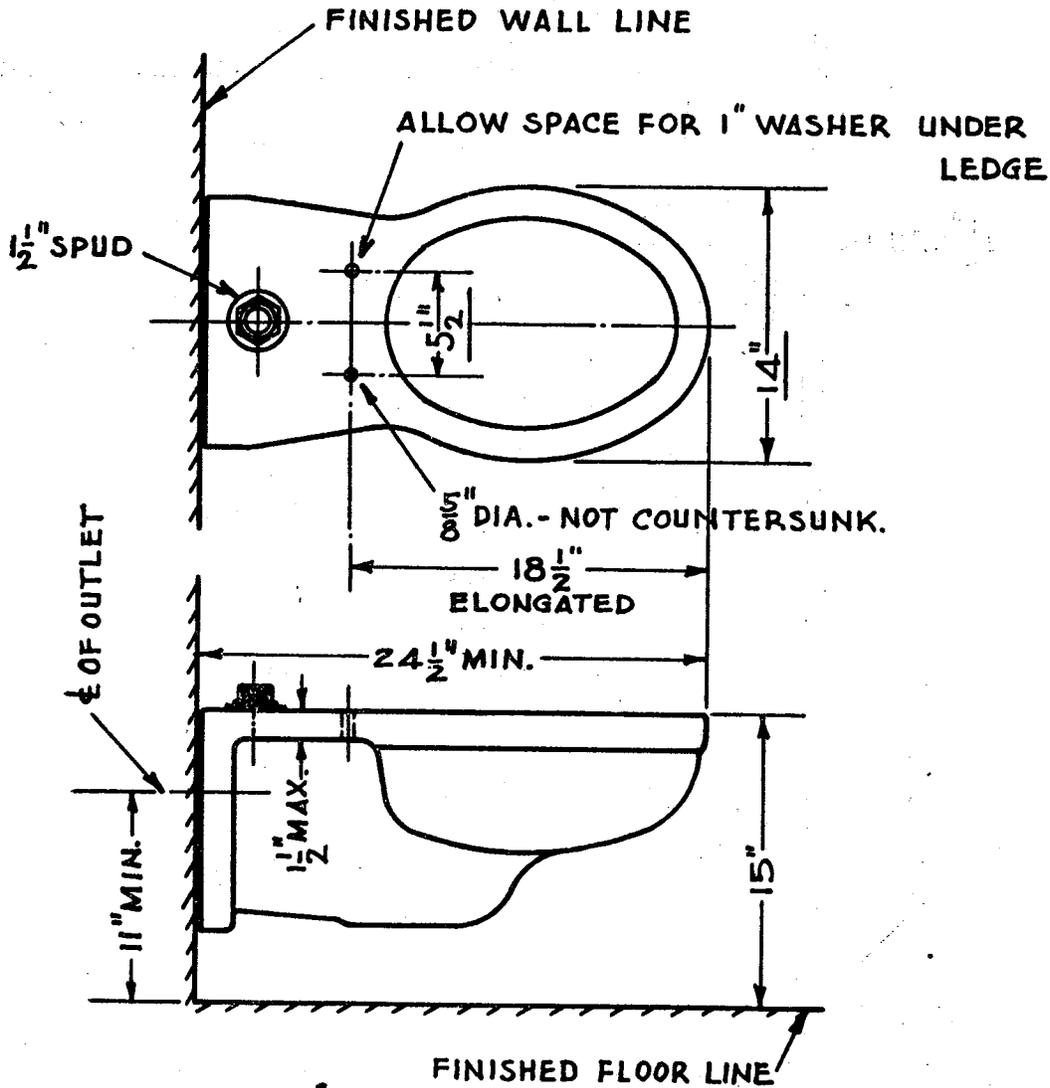


FIGURE 9.—Blow-out wall-hanging water-closet bowl.

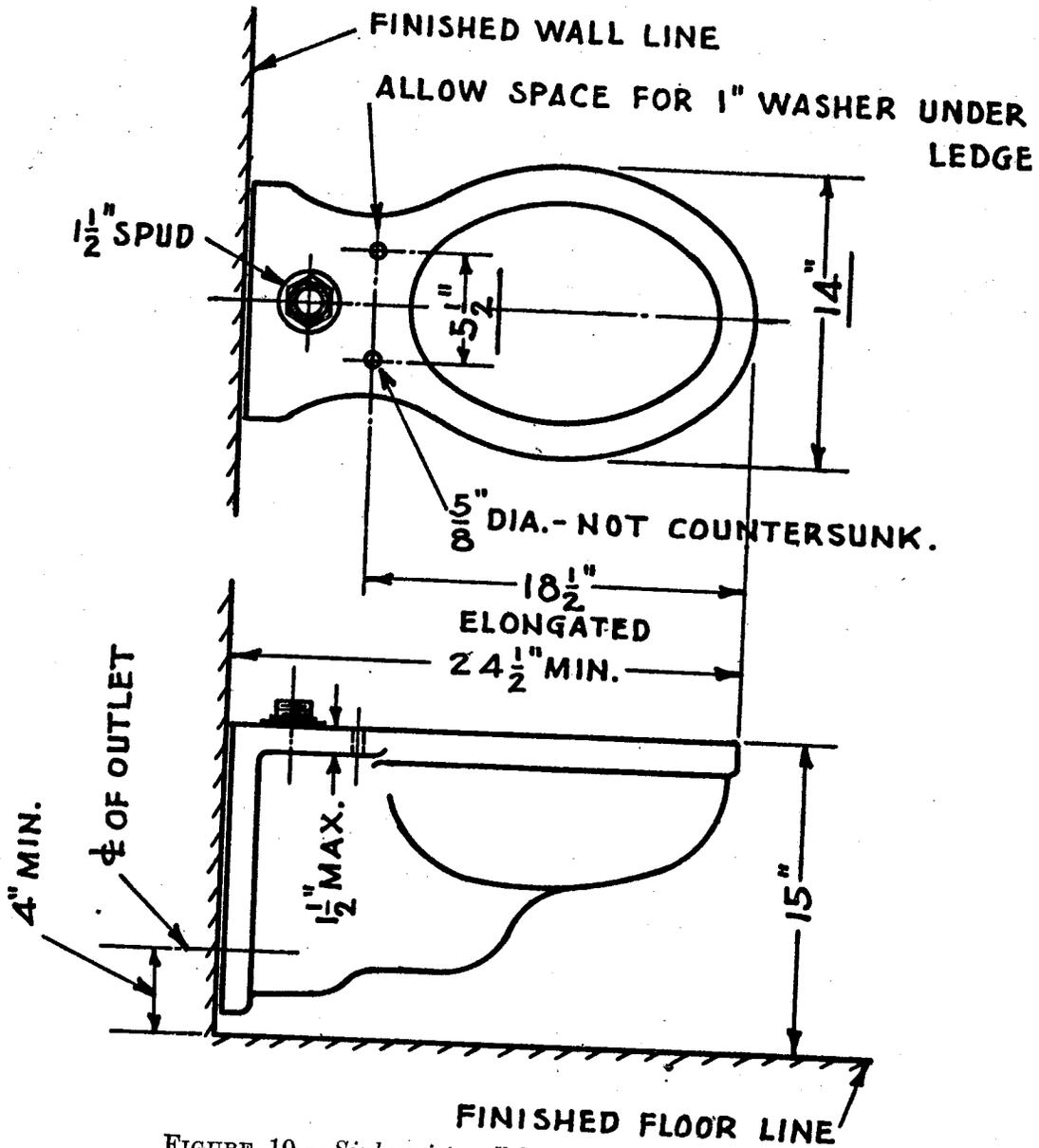
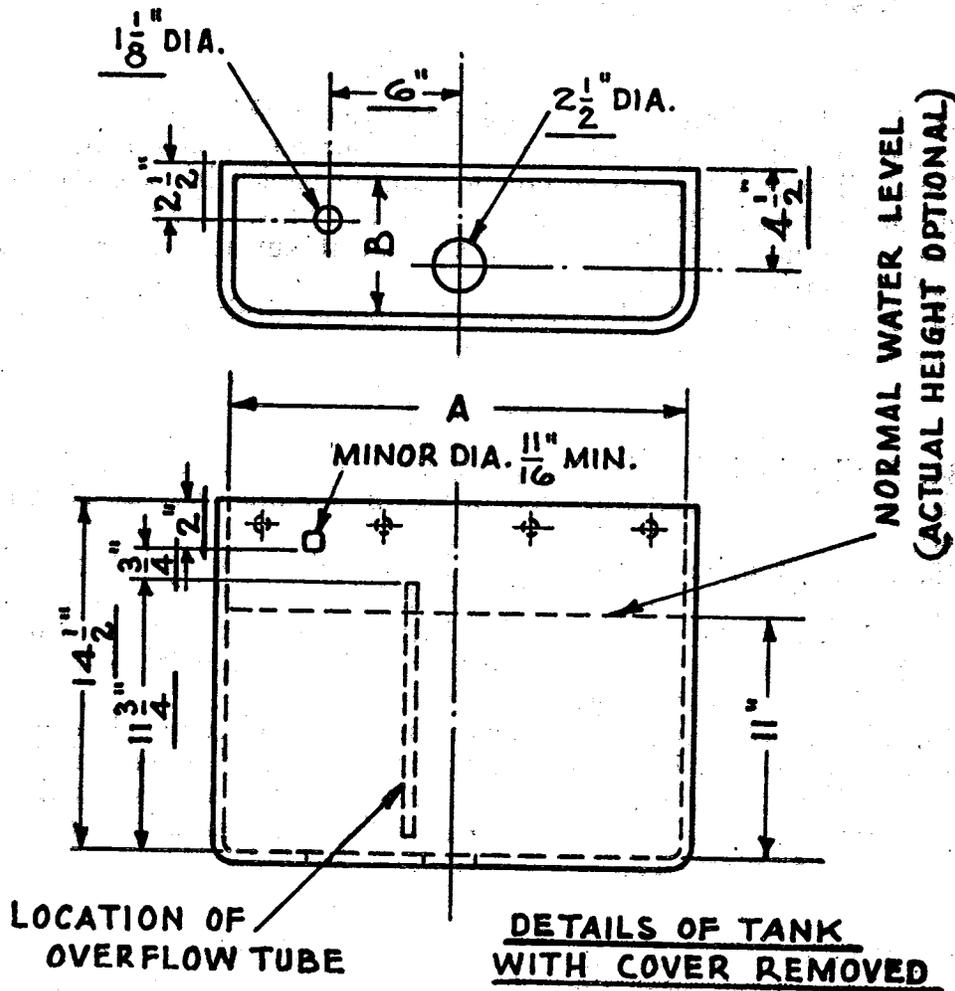


FIGURE 10.—Siphon-jet wall-hanging water-closet bowl.



SIZE	CAPACITY*	A	B
18 INCH	3 1/2 GAL.	18"	6"
20 INCH	4 1/2 GAL.	19 3/4"	6 3/4"

* ACTUAL FLUSH WITH SUPPLY SHUT OFF.

FIGURE 11.—Low tanks.

31. High Tanks for water closets shall be for chain pull with lever on left-hand side. High tanks for urinals shall have automatic flush valves. The following sizes are staple:

No. 1 (To flush approximately 1½ gallons).

No. 3 (To flush approximately 3 gallons).

No. 4 (To flush approximately 4½ gallons).

LAVATORIES

32. Lavatory shall be of one-piece vitreous china with oval, rectangular or D-shaped bowl, apron and front antisplash rim. Lavatories shall have integral overflow at front or back with cross-sectional area not less than 1¼ square inches at every point. Overflow point of slab shall be not more than ½ inch above slab surface at lowest point of any faucet bearing.

33. The location of holes for faucets, spouts, drains, etc., shall be as shown in figures 12, 13, and 14, inclusive.

URINALS

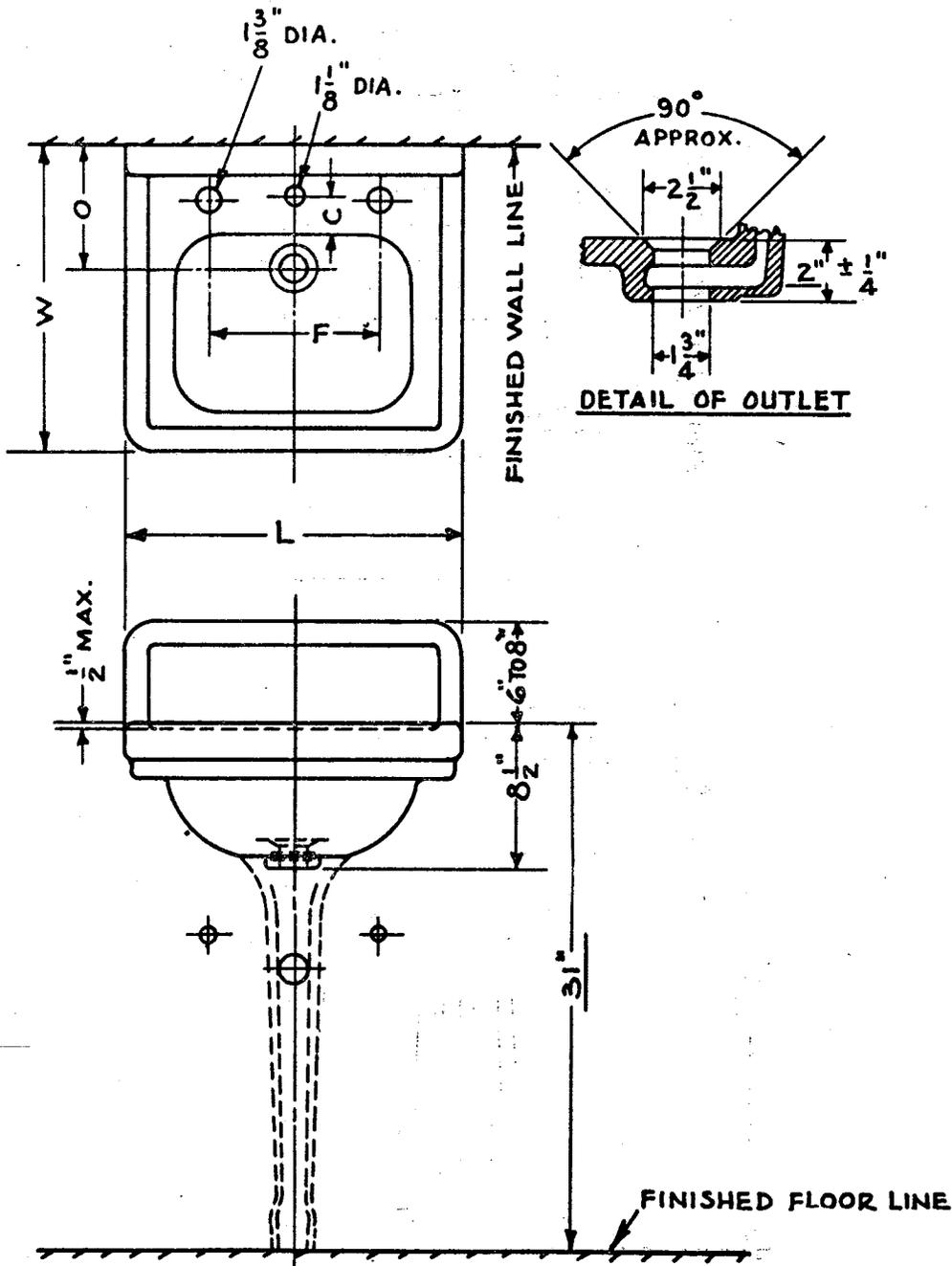
34. Stall urinal shall be one-piece vitreous china straight front or with extended shields and with integral flushing rim as shown in figure 15.

35. Pedestal urinal shall be of vitreous china with integral flush rim, siphon jet, top inlet, and pedestal base with siphon trap, all molded in the ware. The depth of the water seal shall be not less than 2 inches, and the siphon trapway shall pass a solid ball not less than 1½ inches in diameter. See figure 16.

36. Wall-hanging wash-out urinal shall be of vitreous china and of wash-out type with integral flushing rim, trap and extended shields, all molded in the ware. Fixture may have integral cast strainer or open trapway. The water seal shall not be less than 2 inches. Shall be as shown in figure 17.

SERVICE SINKS

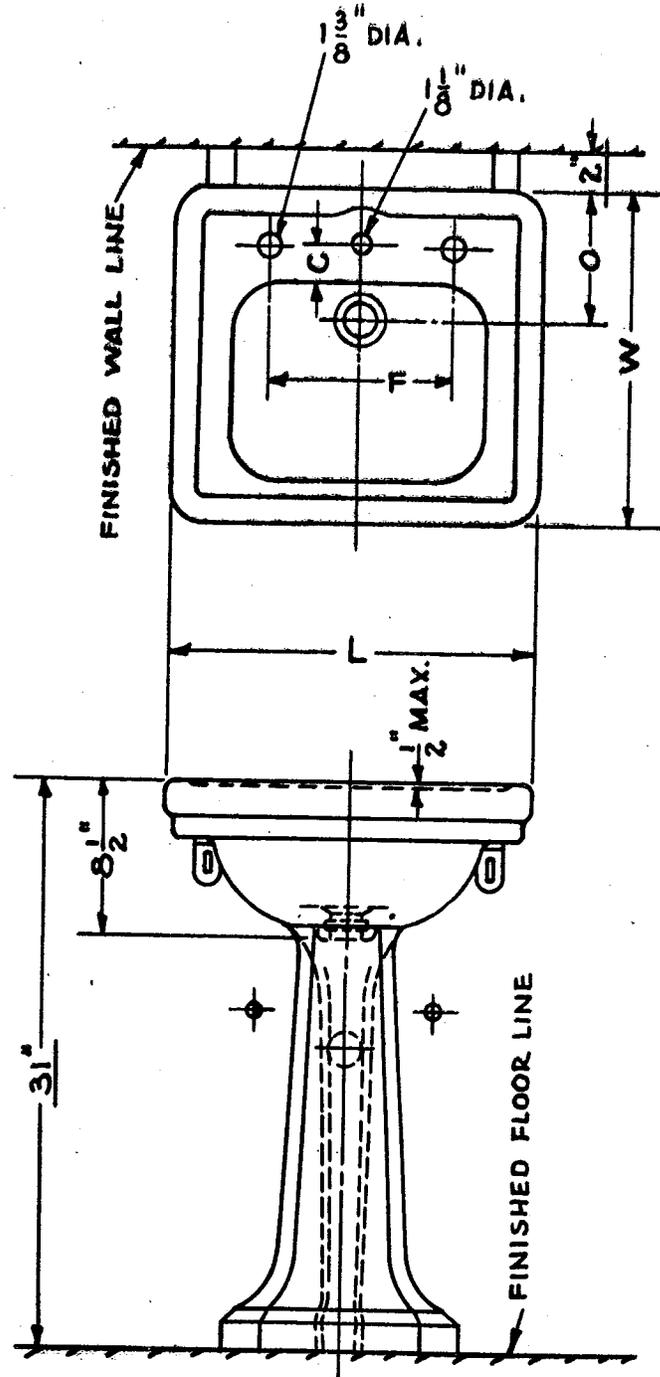
37. Vitreous china service sink shall be of one-piece vitreous china with integral back, with space behind back for supplies. Shall be as shown in figure 18.



NOM. SIZE	L	W	F [†]	O [*]	C [⊙]
20 x 18"	20"	18"	10"	7 1/2"	2 1/2"
24 x 20"	24"	20"	12"	8"	2 1/2"

† MAY BE 4" ⊙ TOLERANCE, ± 1/2"
 * TOLERANCE, ± 3/4"

FIGURE 12.—Straight-front lavatories, with back.



NOM. SIZE	L	W	F [†]	O [*]	C [⊙]
20×18"	20"	18"	10"	7 1/2"	2 1/2"
24×20"	24"	20"	12"	8"	2 1/2"
27×22"	27"	22"	12"	8 1/2"	2 1/2"

† MAY BE 4"

* TOLERANCE, ± 3/4"

⊙ TOLERANCE, ± 1/2"

FIGURE 13.—Straight-front lavatories, without back.

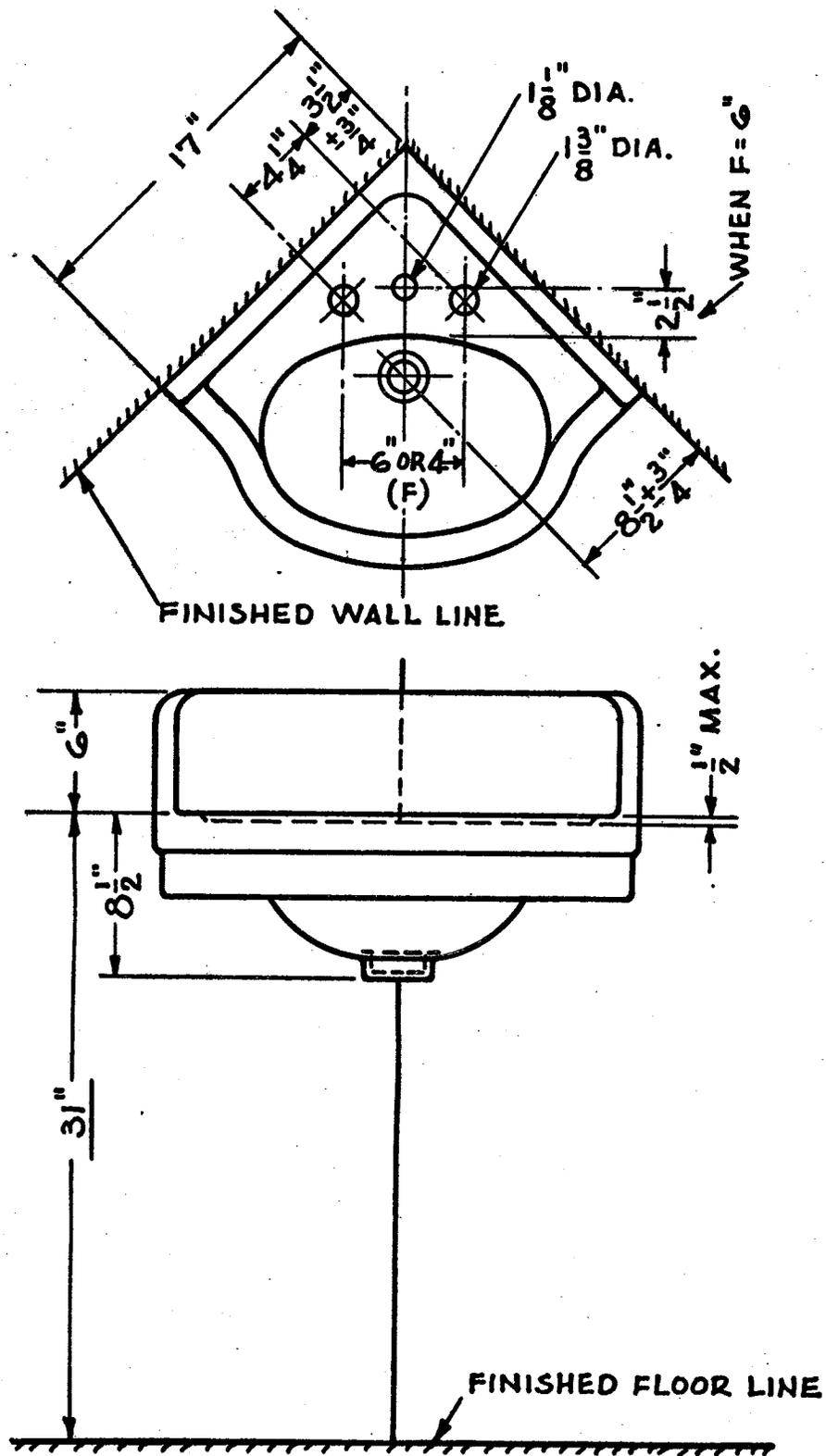


FIGURE 14.—Round-front corner lavatory, with back.

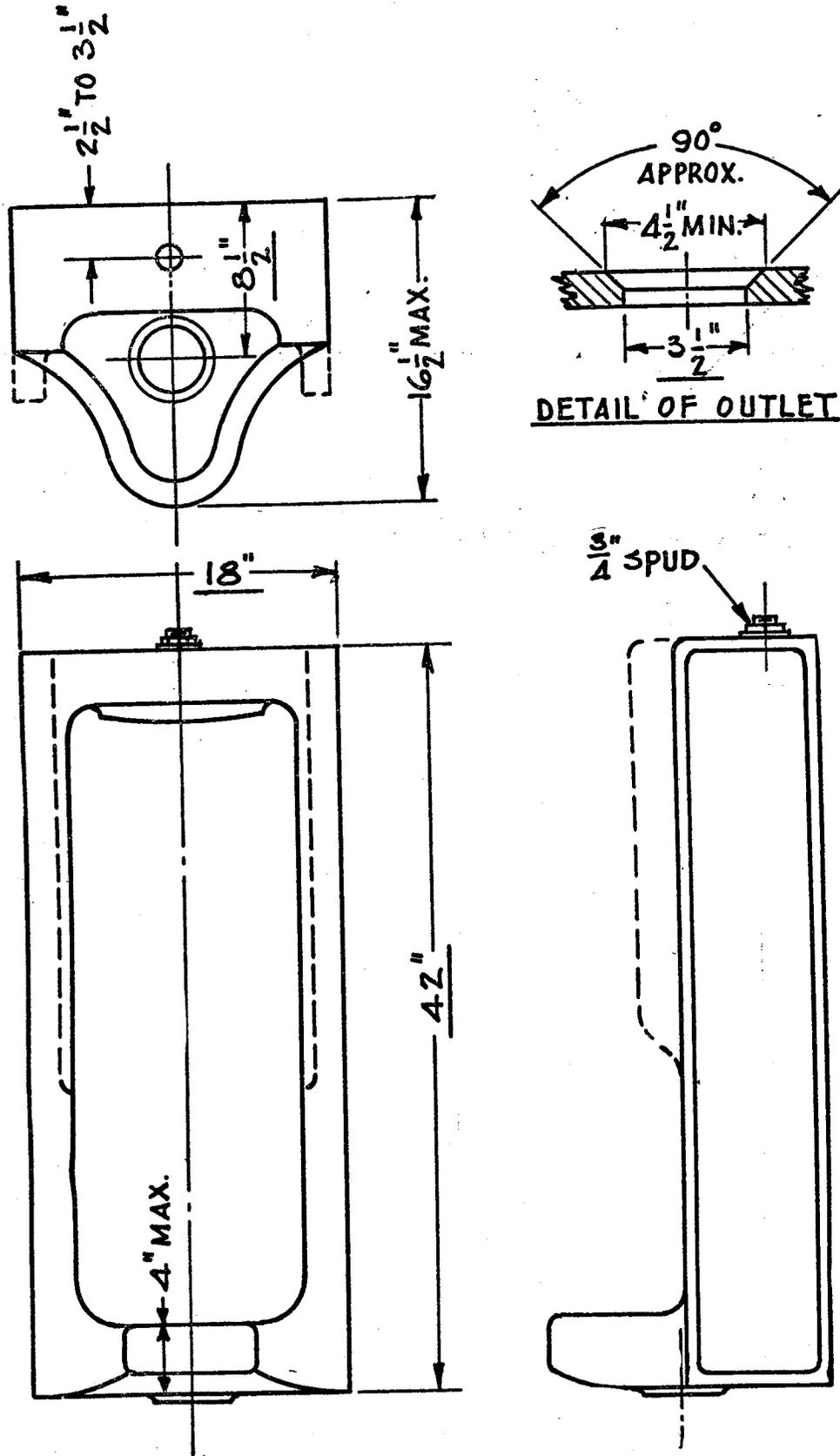


FIGURE 15.—Stall urinals.

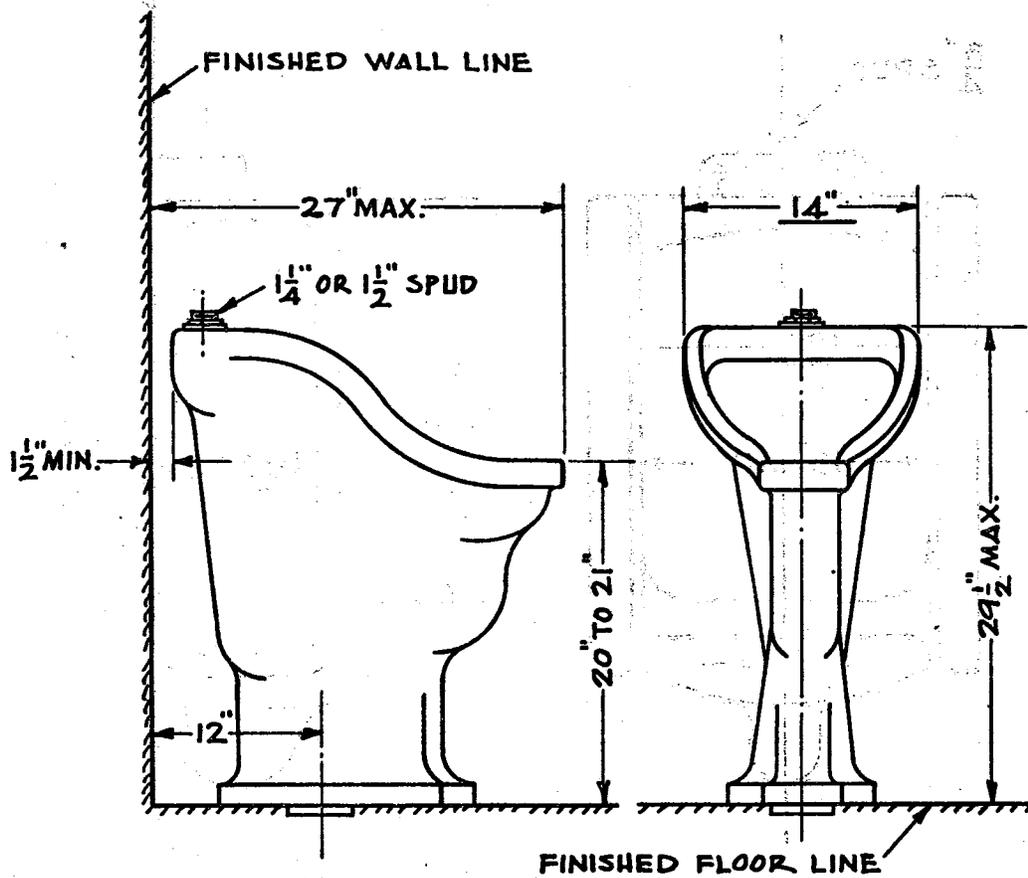


FIGURE 16.—Top-supply pedestal urinal.

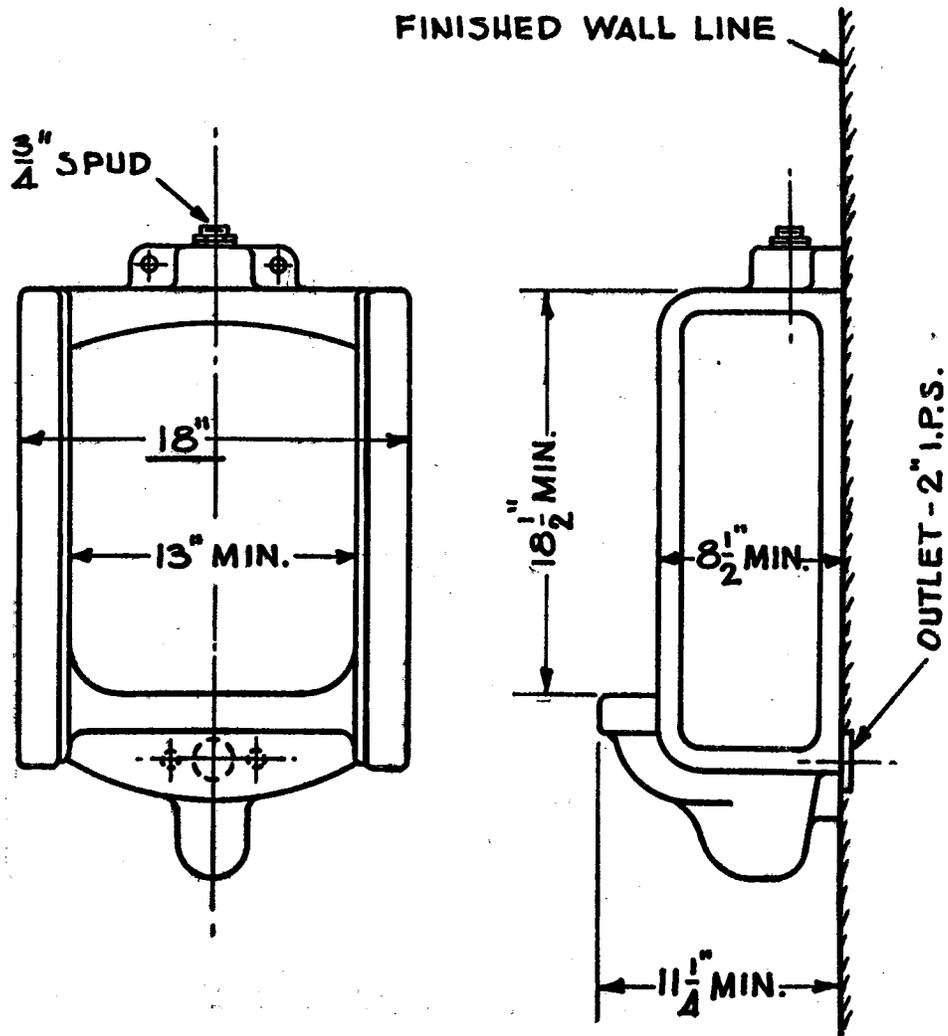


FIGURE 17.—Wall-hanging wash-out urinal.

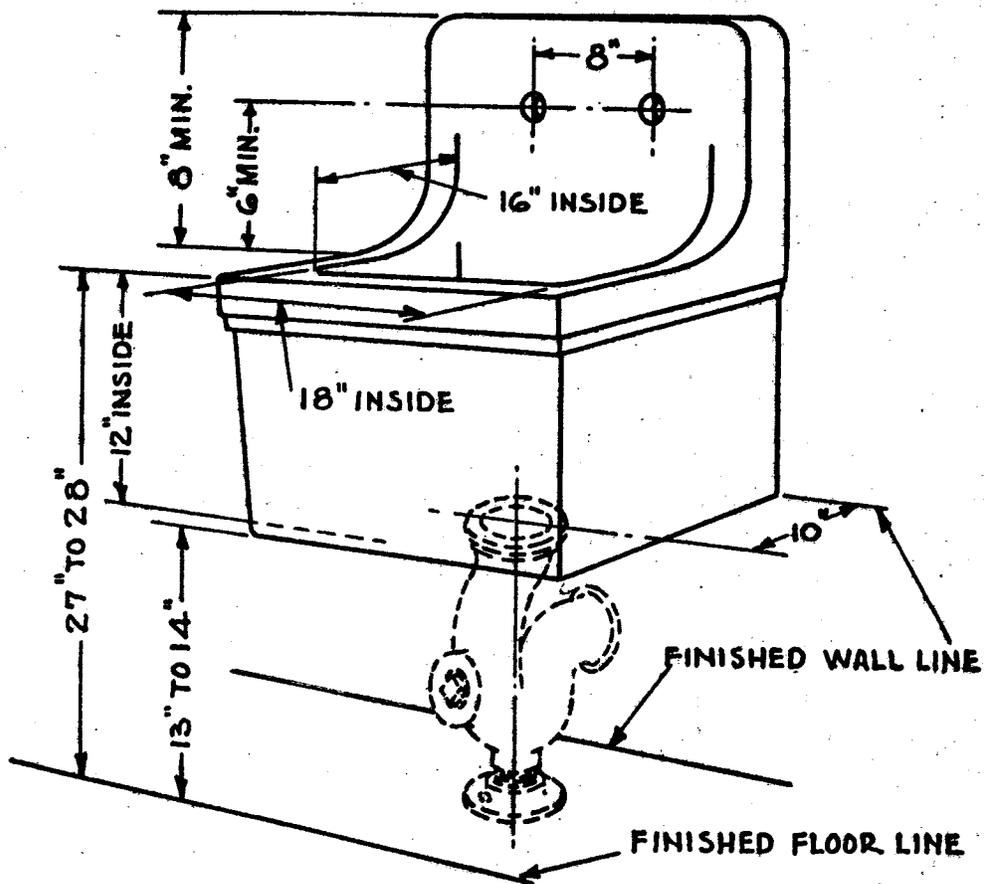


FIGURE 18.—Service sink.

METHODS OF TEST

38. *Absorption test.*—Either the “Red Ink Test” or the “Boiling Test” as described may be used but in cases of dispute the “Boiling Test” shall be used.

38a. *“Red ink test.”*—A fractured piece of material taken from any part of a vitreous china plumbing fixture, after being immersed in red aniline ink of good color strength for one hour, shall not show any discoloration through the glaze and shall not show absorption, when broken, to a depth greater than $\frac{1}{8}$ inch below the surface of fracture at any point.

38b. *“Boiling test.”*—The test sample shall be three fragments taken from any part of the fixture and each fragment shall have approximately 5 square inches of surface area and a thickness of not more than $\frac{1}{8}$ inch. The pieces shall be dried to constant weight at $230^{\circ} \pm 10^{\circ}$ F and shall then be stored in a desiccator until cooled to room temperature. After reaching room temperature the specimens shall be weighed on a balance to an accuracy of 0.1 gram.

38c. The weighed pieces shall then be placed in distilled water in a suitable vessel, supported so that they shall not be in contact with the heated bottom of the container, and boiled for two hours. They shall then be allowed to remain in the water for 20 hours, then dried slightly with a damp towel to remove excess water and reweighed to an accuracy of 0.1 gram.

38d. The absorption shall be reported as a percentage of the weight of the dried sample obtained by dividing the weight of the water absorbed, in grams, by the weight of the dried test piece, in grams, and multiplying by 100. The china shall not absorb more than $\frac{1}{2}$ of 1 percent of its own weight.

39. *Crazing test.*—A test specimen not more than $\frac{5}{8}$ ” in thickness by 5 inches square is suspended in a solution of equal portions by weight of anhydrous calcium chloride and water boiled at a constant temperature of $230^{\circ} \pm 5^{\circ}$ F for $1\frac{1}{2}$ hours. It is then removed and immediately plunged into an ice water bath of 36° to 38° F until chilled. The specimen is then soaked for 12 hours in a concentrated solution of methylene blue dye after which it is examined for craze lines as indicated by penetration of blue dye. No crazing is permissible.

40. *Flushing test for water-closet bowls.*

40a. *Paper.*—The standard size paper to be used in test is $4\frac{1}{2} \times 5$ inches. If smaller or larger size is used, the load should be increased or decreased proportionately based on the square inches of surface per sheet.

40b. For interfold (pack type) toilet paper, six (6) sheets in all is considered equivalent to one six-sheet strip of single roll paper.

40c. The “test load” for the flushing test shall be as given in the following table depending upon the absorption time of the paper used.

Paper absorption time (double-strip method)	Number of crumpled 6-sheet strips of single- thickness roll toilet paper
<i>Seconds</i>	
0 to 3.....	7
4 to 6.....	6
7 to 15.....	5

40d. Method for determining absorption time of paper. To determine the absorption time of roll toilet paper by the double-strip method, take two two-sheet strips of paper and place them together with perforations in line, and with curvature from roll in same direction in order to insure uniform contact.

40e. These two strips should then be placed gently on the surface of the water with convex side of paper down. The time in seconds is recorded from the moment the paper touches the water until a spot of moisture approximately $\frac{1}{8}$ inch in diameter appears on the upper strip. Spots appearing through imperfections in the paper or at edges should be ignored. (This test can best be made in a lavatory basin or sink where light is usually better than in closet bowl.)

40f. The absorption time of interfold (pack type) paper is determined in the same manner as roll toilet paper, after first cutting the interfold sheets where folded, then placing the two sheets on the surface of the water.

40g. Procedure for actual testing. The bowl should be level, the trap and outlet clear, the bowl filled to weir level; the tank filled to the water line where marked and, in the absence of a mark, to a point 1 inch below top of overflow; the float valve (ball cock) should be adjusted to fill tank in not more than 3 minutes.

40h. The given number of six-sheet strips of roll toilet paper as determined by absorption time, should each be crumpled into a loose ball measuring 2 to 3 inches in diameter and dropped altogether as a "test load" into the bowl and the bowl flushed immediately. The bowl shall flush like "test loads" repeatedly without clogging.

40i. If interfold (pack type) paper is used, six sheets should be crumpled into a ball, and the test made as outlined above for roll paper.

40j. No paper other than common toilet paper, coming within the absorption time range as mentioned above, should be used for test.

40k. When water closets to be tested are connected to direct flushing valves, the control stop and valve should first be adjusted for best flushing action. The flow pressure (maintained at the flushing valve inlet during test) should not be less than:

10 pounds per square inch for siphon action closets.

20 pounds per square inch for blow-out closets.

41. *Method of determining warpage.*—The fixture is placed on a flat surface so as to ascertain the amount of deviation from the horizontal plane that exists at the edges of the fixture. If a feeler gage of thickness equal to the total allowable warpage will not slide under the fixture without forcing, the fixture satisfactorily comes within the warpage limitations. If the fixture will rock on two opposite high corners, the horizontal plane shall be determined by placing one feeler gage of the total warpage allowed under one low corner and forcing the fixture down on this gage. If a second feeler gage of the same thickness will not slide under the fixture at any other point, the fixture is not warped out of the horizontal plane by more than the specified tolerance and satisfactorily comes within the warpage limitations.

MARKING AND LABELING

42. All vitreous china plumbing fixtures shall be plainly and permanently branded for identification with the name or trade-mark of the manufacturer.

43. Labels shall be used only on such ware as conforms to the requirements for "first quality" as set forth in this commercial standard. The following uniform label is recommended.

The manufacturer guarantees this vitreous china plumbing fixture to be first quality and to meet the grading standards and tests of Commercial Standard CS20-42 as issued by the National Bureau of Standards of the United States Department of Commerce. If this fixture proves defective due to faulty workmanship or material within one year after installation, a new fixture of the same type and size will be furnished. No labor or consequential damages will be allowed.

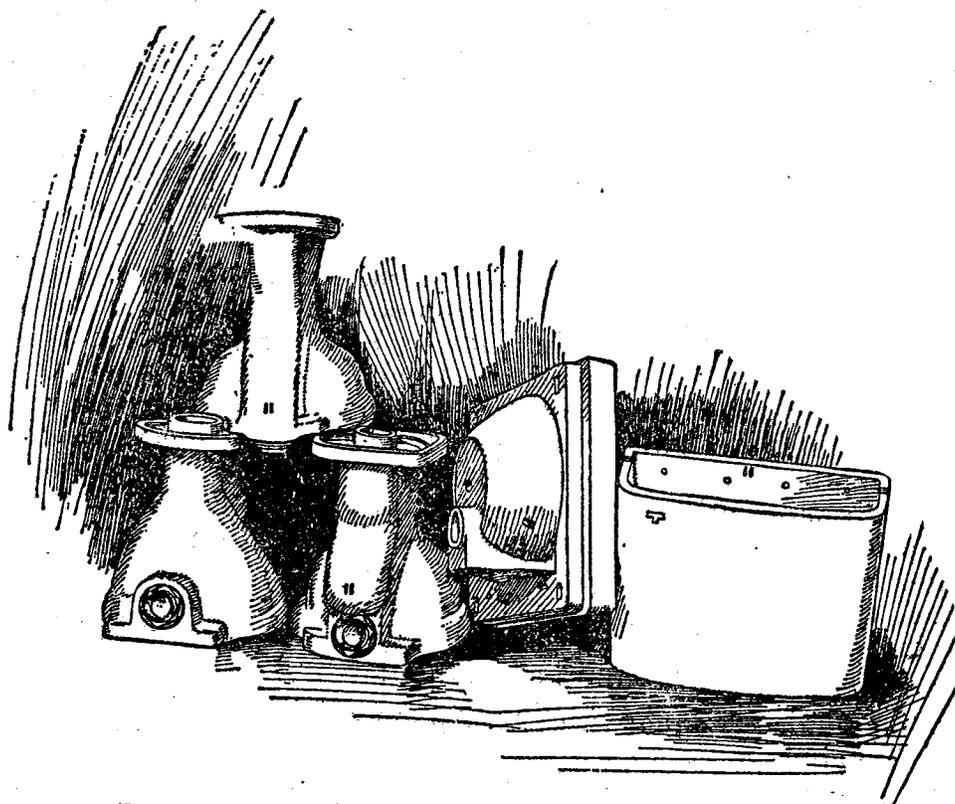


FIGURE 19.—Location and character of marking for culls.

44. The industry has been embarrassed and the consumer victimized by unscrupulous distributors selling "cull" grade fixtures as "first quality" fixtures. In order to prevent the possibility of this unfair practice all "cull" grade ware shall be indelibly marked by the maker with two parallel lines cut through the glaze into the body of the ware at the location (see fig. 19) recommended by the Manufacturers' Advisory Committee on Vitreous China Plumbing Fixtures. These cuts shall be filled with a bright red varnish or enamel which is resistant to the action of hot water. No labels shall be placed on "culls."

45. All packages containing "culls" shall be marked with two splashes of red on one end of the package so as to be visible without tearing down stacks of packages.

NOMENCLATURE AND DEFINITIONS

Blister.—A raised portion of the surface $\frac{1}{32}$ (0.031) inch and less than $\frac{1}{8}$ (0.125) inch in maximum dimension.

Large blister.—A raised portion of the surface $\frac{1}{8}$ (0.125) inch to $\frac{1}{4}$ (0.25) inch, inclusive, in maximum dimension.

Bubble.—A raised portion of the surface or a sand speck smaller than $\frac{1}{32}$ (0.031) inch in maximum dimension.

Craze.—Fine cracks in the glaze.

Culls.—Serviceable ware which grades below “first quality” but which is safe from a health or sanitary point of view.

Discoloration.—A colored spot over $\frac{1}{4}$ (0.25) inch in maximum dimension, or a sufficient number of specks or spots to give the effect of a change in color.

Dull or eggshell finish.—Dead or flat finish. Undeveloped glaze. A semiglazed finish with numerous very fine pinholes or slightly matted in appearance. Not glossy.

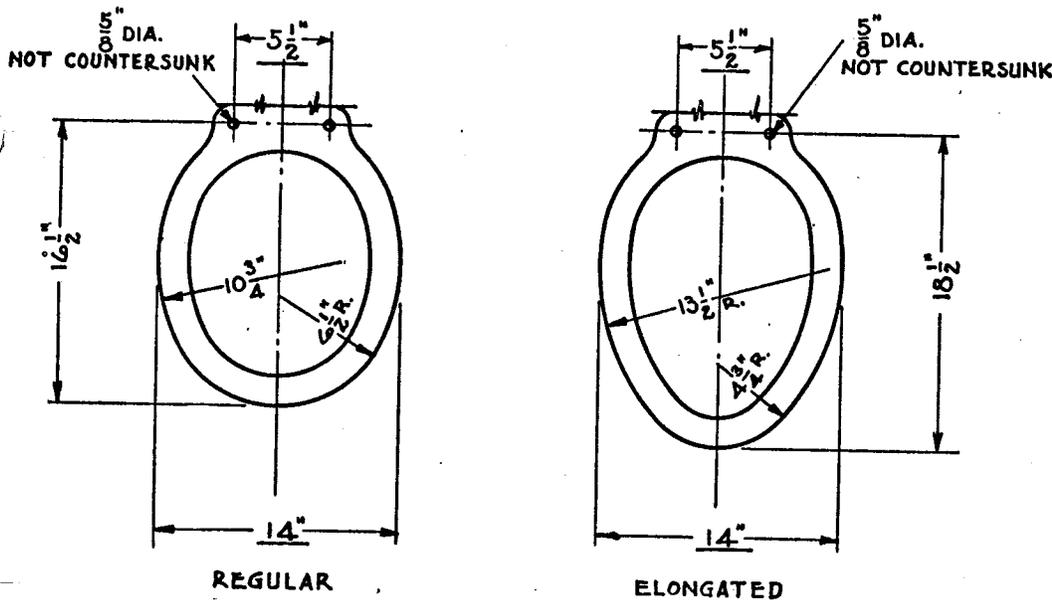


FIGURE 20.—Top contour for water-closet bowls.

Dunt.—A hair line fracture extending through the body, and caused by strains set up in the process of manufacture.

Elongated water-closet bowl.—Water-closet bowl having a top contour designed as shown in figure 20.

Exposed body.—Unglazed portion $\frac{1}{16}$ (0.063) inch or more in maximum dimension.

Finish.—Texture and condition of surface other than color.

Fire check.—Fine shallow crack in the body not covered with glaze. (When sufficiently covered with glaze as to be easily cleaned, it is not detrimental.)

First quality.—First class ware in conformity with the limitations of the grading rules.

Fittings.—Adjuncts to a fixture subject to selection or option of the purchaser, as, for example, faucets and waste plugs.

Fixture.—The china piece only, without “trimmings” and/or “fittings.”

- Flushing surface.*—The surface, visible after installation, which may be wet during the operation of the fixture.
- Pinhole.*—Unglazed portion of body, or small hole under $\frac{1}{16}$ (0.063) inch in maximum dimension.
- Polishing mark.*—A spot not larger than $\frac{3}{8}$ (0.375) inch in maximum dimension where some minor blemish has been ground off and the surface polished.
- Pottery square.*—A square 2 inches on each side. For grading purposes, it may be a 2-inch square hole cut in a small sheet of any flexible material, such as rubber or paper, for convenience in sliding over irregular surfaces to determine segregation.
- Projection.*—A raised portion of the surface over $\frac{1}{4}$ (0.25) inch in maximum dimension.
- Regular (round front) water-closet bowl.*—A water-closet bowl having a round front rim. (See fig. 20.)
- Roughing-in measurement.*—Dimension from finished wall on floor to center of waste or supply opening.
- Segregation.*—More than four spots, blisters, or pinholes in any "pottery square."
- Speck.*—A colored portion less than $\frac{1}{32}$ (0.031) inch in maximum dimension. Specks less than $\frac{1}{100}$ (0.01) inch in maximum dimension, unless in sufficient number to form a discoloration are not counted.
- Spot.*—A colored portion of the surface $\frac{1}{32}$ (0.031) inch and less than $\frac{1}{8}$ (0.125) inch in maximum dimension.
- Large spot.*—A colored portion $\frac{1}{8}$ (0.125) inch to $\frac{1}{4}$ (0.25) inch, inclusive, in maximum dimension.
- Spud.*—Threaded brass connection inserted in the vitreous chinaware.
- Tank.*—The term tank shall be applied to any vitreous china fixture which contains water to flush another plumbing fixture.
- High tank.*—Designed to be mounted with bottom more than two (2) feet above the floor.
- Low tank.*—Designed to be mounted with bottom two (2) feet or less above the floor.
- Trap.*—A device so constructed as to prevent the passage of air through a fixture without materially affecting the flow of sewage or waste through it.
- Trimmings.*—Parts, other than china, regularly supplied with a fixture, as, for example, closet spuds, wall hangers, and tank trim. Do not include "fittings."
- Visible surface.*—The surface which after installation of the fixture is readily visible to an observer in normal standing position.
- Vitreous china.*—Vitreous china is a homogeneous mixture of ceramic materials bonded by fusion of these materials at high temperatures. Composition and heat treatment is such as to result in a body so impervious to moisture penetration that it will not absorb more than $\frac{1}{2}$ of 1 percent of its weight of water when subjected to an absorption test as specified herein.
- Vitreous china plumbing fixtures.*—The term "vitreous china" shall be applied only to such plumbing fixtures as will pass the absorption and crazing tests specified herein.
- Water surface.*—The surface of the still water in the water-closet bowl, when filled to the top of the dam.

Water-closet bowl.—The term "water-closet bowl" is the accepted general term applicable to such fixtures whether singly or part of a "combination."

Water-closet combination.—The term "water-closet combination" applies to a "water-closet bowl" with means for flushing.

Wavy finish.—A defect in the finish having the appearance of numerous runs in the glaze; irregular or mottled.

Well.—A pocket, open at top, formed inside a water-closet bowl at the entrance to the trap.

RECOMMENDED PROVISIONS

46. It is recommended that the industry work towards one standard roughing-in dimension for water-closet bowls and that this dimension be 12 inches.

EFFECTIVE DATE

The revised standard is effective for new production from July 10, 1942.

STANDING COMMITTEE

The following individuals comprise the membership of the standing committee, which is to review, prior to circulation for acceptance, revisions proposed to keep the standard abreast of progress. Each association nominated its own representatives. Comment concerning the standard and suggestions for revision may be addressed to any member of the committee or to the Division of Trade Standards, National Bureau of Standards, which acts as secretary for the committee.

HUGH R. VAN SCIVER (chairman), Trenton Potteries Co., Trenton, N. J.
D. D. COUCH, American Radiator & Standard Sanitary Corporation, Bessemer Building, Pittsburgh, Pa.

A. V. GEMMILL, Speakman Co., Wilmington, Del.

JERE L. MURPHY, J. L. Murphy, Inc., 340 E. 44th Street, New York, N. Y.
(Representing National Association of Master Plumbers of the United States, Inc.)

W. J. SPILLANE, Jas. B. Clow & Sons, Box NN, Chicago, Ill.

C. W. OWEN, E. G. Schafer & Co., 2321 4th Street, N. E., Washington, D. C.

BENJAMIN CADBURY, Hajoca Corporation, Box 7319, Philadelphia, Pa.

THEODORE I. COE, 4000 Cathedral Avenue, Washington, D. C. (Representing American Institute of Architects.)

I. J. FAIRCHILD, National Bureau of Standards, Washington, D. C.

HISTORY OF PROJECT

General Conference.—Pursuant to a request from the industry and following several preliminary conferences of interested manufacturers, a public conference was held September 22, 1926, which resulted in the establishment of Simplified Practice Recommendation R52, Staple Vitreous China Plumbing Fixtures. On recommendation of the Standing Committee, this was expanded and superseded by a pamphlet entitled Staple Vitreous China Plumbing Fixtures, Commercial Standard CS20-30, effective for new production March 3, 1930.

First revision.—In response to a demand for standards on additional types of fixtures, as well as for additional definitions and revisions, the Vitreous China Plumbing Fixtures Association submitted recommended revisions on February 10, 1936, which were subsequently approved by the Standing Committee and circulated to all concerned for written acceptance on April 28, 1936. As announced to the trade under date of June 30, 1936, the revised standard was accepted and promulgated as Commercial Standard CS20-36, effective for new production from September 30, 1936.

Second revision.—On January 8, 1942, the Vitreous China Plumbing Fixtures Association submitted recommendations for revision of the standard to include several additional items and three new tests. These recommendations were subsequently approved by the standing committee and circulated on May 4, 1942, to all concerned for written acceptance. Following acceptance by a satisfactory majority, the success of the revision was announced on June 10, 1942.

ACCEPTANCE OF COMMERCIAL STANDARD

If acceptance has not previously been filed, this sheet properly filled in, signed, and returned will provide for the recording of your organization as an acceptor of this commercial standard.

Date -----

Division of Trade Standards,
National Bureau of Standards,
Washington, D. C.

Gentlemen:

Having considered the statements on the reverse side of this sheet, we accept the Commercial Standard CS20-42 as our standard of practice in the

Production ¹ Distribution ¹ Testing ¹ Use ¹

of staple vitreous china plumbing fixtures.

We will assist in securing its general recognition and use, and will cooperate with the standing committee to effect revisions of the standard when necessary.

Cut on this line

Signature -----

Type or print } -----
name and address }
—Title, if any— } -----

If acceptance officially represents a firm or organization, kindly type or print that information below.

Organization -----
(Fill in exactly as it should be listed)

Address -----

¹ Please designate which group you represent by drawing lines through the other three. Please file separate acceptances for all subsidiary companies and affiliates which should be listed separately as acceptors. In the case of related interests, trade papers, etc., desiring to record their general approval, the words "in principle" should be added after the signature.

TO THE ACCEPTOR

The following statements answer the usual questions arising in connection with the acceptance and its significance:

1. *Enforcement.*—Commercial standards are commodity specifications voluntarily established by mutual consent of those concerned. They present a common basis of understanding between the producer, distributor, and consumer and should not be confused with any plan of governmental regulation or control. The United States Department of Commerce has no regulatory power in the enforcement of their provisions, but since they represent the will of the interested groups as a whole, their provisions through usage soon become established as trade customs, and are made effective through incorporation into sales contacts by means of labels, invoices and the like.

2. *The acceptor's responsibility.*—The purpose of commercial standards is to establish for specific commodities, nationally-recognized grades or consumer criteria and the benefits therefrom will be measurable in direct proportion to their general recognition and actual use. Instances will occur when it may be necessary to deviate from the standard and the signing of an acceptance does not preclude such departures; however, such signature indicates an intention to follow the commercial standard where practicable, in the production, distribution, or consumption of the article in question.

3. *The Department's responsibility.*—The major function performed by the Department of Commerce in the voluntary establishment of commercial standards on a Nation-wide basis is fourfold: first, to act as an unbiased coordinator to bring all interested parties together for the mutually satisfactory adjustment of trade standards; second, to supply such assistance and advice as past experience with similar programs may suggest; third, to canvass and record the extent of acceptance and adherence to the standard on the part of producers, distributors, and users; and fourth, after acceptance, to publish and promulgate the standard for the information and guidance of buyers and sellers of the commodity.

4. *Announcement and promulgation.*—When the standard has been endorsed by a satisfactory majority of production or consumption in the absence of active, valid opposition, the success of the project is announced. If, however, in the opinion of the standing committee or the Department of Commerce, the support of any standard is inadequate, the right is reserved to withhold promulgation and publication.

ACCEPTORS

The organizations and individuals listed below have accepted this commercial standard as their standard of practice in the production, distribution and use of staple vitreous china plumbing fixtures. Such endorsement does not signify that they may not find it necessary to deviate from the standard nor that producers so listed guarantee all of their products in this field to conform with the requirements of this standard. Therefore, specific evidence of conformity should be obtained where required.

ASSOCIATIONS

American Hospital Association, Simplification & Standardization Committee, Philadelphia, Pa.
 American Hotel Association, New York, N. Y.
 American Specification Institute, Chicago, Ill.
 Associated General Contractors of America, Inc., The, Washington, D. C.
 Copper & Brass Research Association, New York, N. Y. (In principle.)
 Heating, Piping & Air Conditioning Contractors Cincinnati Association, Cincinnati, Ohio.
 Hospital Association of Philadelphia, Philadelphia, Pa.
 Kenton & Campbell County Master Plumbers Association, Newport, Ky.
 National Association of Master Plumbers, New York, N. Y.
 Norfolk, Plumbing & Heating Contractors Association of, Norfolk, Va.
 Saginaw Association of Master Plumbers Saginaw, Mich.
 San Pedro Master Plumbers Association, San Pedro, Calif.
 Tile Contractors Association of America, Inc., Washington, D. C.
 Vermont Master Plumbers Association, Windsor, Vt.
 Vitreous China Plumbing Fixtures Association, Pittsburgh, Pa. (In principle.)

FIRMS

Abington Sanitary Manufacturing Co., Abington, Ill.
 Adams, Franklin O., Tampa, Fla.
 Ahern Co., John F., Fond du Lac, Wis.
 Aird-Don Co., Troy, N. Y.
 Aitchison-Richmond Supply Co., St. Joseph, Mo.
 Albany Hospital, Albany, N. Y.
 Altfillisch, Charles, Decorah, Iowa.

American Ideal Heating Co., Baltimore, Md.
 American Radiator & Standard Sanitary Corporation, Pittsburgh, Pa., and Sioux Falls, S. Dak.
 Andrews, Jones, Biscoe & Whitmore, Boston, Mass.
 Appleby Bros. & Whittaker Co., Harrisburg, Pa.
 Auchinachie & Sons, Binghamton, N. Y.
 Auler, Jenson & Brown, Oshkosh, Wis.
 Austin, O. M., Johnson City, N. Y.
 Baker Manufacturing Co., Kansas City, Mo.
 Balch & Lippert, Madison, Wis.
 Balderston Co., Warren, Trenton, N. J.
 Baldwin, Frank, Newton, Iowa.
 Baltimore, Bureau of Plans & Surveys of, Baltimore, Md.
 Bargelt & Son, Hanover, Pa.
 Barrett Hardware Co., Joliet, Ill.
 Barrett Supply Co., Augusta, Ga.
 Basche Sage Hardware Co., Baker, Oreg.
 Bayley Heating Supply Co., Milwaukee, Wis.
 Beacham & LeGrand, Greenville, S. C.
 Beall, Leo E., Sturgis, Mich.
 Berndt, Hugo W., Milwaukee, Wis.
 Beshore & Co., Chas. T., Marion, Ind.
 Bethlehem Plumbing Supply Co., Bethlehem, Pa.
 Biggs-Kurtz Hardware Co., The, Grand Junction, Colo.
 Biggs Pump & Supply Co., Inc., Lafayette, Ind.
 Bishop, Horatio W., La Mesa, Calif.
 Black Hardware Co., Galveston, Tex.
 Blackwell Wielandy Co., St. Louis, Mo.
 Blake & Co., W. L., Portland, Maine.
 Blake-Rounds Supply Co., Portland, Maine.
 Blithe, Wesley Leshner, Philadelphia, Pa.
 Blodgett Supply Co., Inc., The, Burlington, Vt.
 Blosser, W. L., Moulton, Iowa.
 Boehm, George A., New York, N. Y.

- Bohn & Kern Supply Co., Zanesville, Ohio.
- Bond Supply Co., Kalamazoo, Mich.
- Bradley Co., J. R., Reno, Nev.
- Braman, Dow & Co., Boston, Mass.
- Braseth & Houkom, Fargo, N. Dak.
- Brasher, Preston, Alexandria, La.
- Brazer, Clarence W., New York, N. Y.
- Bridgeport Plumbing Supply Co., Inc., Bridgeport, Conn.
- Brown Co., P. J., Chicago, Ill.
- Brown Wales Co., Boston, Mass.
- Bruce-Rogers Co., Ft. Smith, Ark.
- Brunswick Balke Collender Co., The, Chicago, Ill.
- Brust & Brust, Milwaukee, Wis.
- Buechner & Orth, St. Paul, Minn. (In principle.)
- Bullock Co., H. D., Toledo, Ohio.
- Burnham & Hammond, Chicago, Ill.
- Camden Pottery (Division of Universal Sanitary Manufacturing Co.), Camden, N. J.
- Camlet, J. Thomas, Passaic, N. J.
- Canfield Supply Co., Kingston, N. Y.
- Cannon & Mullen, Salt Lake City, Utah.
- Careva Co., Inc., The, York, Pa.
- Carman-Thompson Co., Lewiston, Maine.
- Carroll, John, Ventnor, N. J.
- Carstens Brothers, Ackley, Iowa.
- Case & Son Manufacturing Co., W. A., Buffalo, N. Y.
- Cedar Rapids Pump & Supply Co., Cedar Rapids, Iowa.
- Central Plumbing Supply Co., The, Bridgeport, Conn.
- Central Supply Co. Of Virginia, Inc., Andover, Va.
- Ceramic Industry, Chicago, Ill. (In principle.)
- Chandler Co., Cedar Rapids, Iowa.
- Channel Co., Long Beach, Calif.
- Chapin, Rollin C., Minneapolis, Minn. (In principle.)
- Chapman, W. H., Detroit, Mich. (In principle.)
- Chicago Faucet Co., The, Chicago, Ill. (In principle.)
- Chicago Pottery Co., Chicago, Ill.
- Chicago, Rock Island & Pacific Railway Co., The, Chicago, Ill.
- Church Manufacturing Co., C. F., Holyoke, Mass.
- Clark, Carl W., Cortland, N. Y.
- Cleary Co., Philadelphia, Pa. (In principle.)
- Clow & Sons, James B., Chicago, Ill.
- Cohen & Son, P., Brooklyn, N. Y.
- Coit, E., New York, N. Y.
- Cole Supply Co., Ltd., Tuscaloosa, Ala.
- Cole Supply Co., Geo. H., Troy, N. Y.
- Connecticut Plumbing Supply Co., Stamford, Conn.
- Conrad & Cummings, Binghamton, N. Y.
- Consoer, Townsend & Quinland, Chicago, Ill.
- Cooper Sanitary Co., Philadelphia, Pa.
- Cordes Supply Co., Milwaukee, Wis.
- Corlett, Will G., Oakland, Calif. (In principle.)
- County Seat Plumbing Supply Co., Inc., White Plains, N. Y.
- Cram & Ferguson, Boston, Mass.
- Crane Co., Chicago, Ill.
- Dalton Supply Co., Clarks Summit, Pa.
- Daly & Sons, Inc., M. J., Waterbury, Conn.
- Dalziel Plumbing Supplies, San Francisco, Calif.
- Daniel-Morris Co., Inc., New York, N. Y.
- Davies Supply Co., The, Chicago, Ill.
- Delehanty, Andrew L., Albany, N. Y.
- Deutz & Brother, A., Laredo, Tex.
- Dick Brothers, Inc., Reading, Pa.
- Dimock, H.—Plumbing & Heating, Rochester, Minn.
- Dodge Corporation, F. W. (Sweet's Catalog Division), Chicago, Ill.
- Dodge & Morrison, New York, N. Y.
- Douglas Co., The John, Cincinnati, Ohio.
- Drake, George H., Buffalo, N. Y.
- Dryden, Allen J., Kingsport, Tenn.
- Dubuque Supply Co., R. A., St. Louis, Mo.
- Dugan, T. M., McKeesport, Pa. (In principle.)
- Du-Kane Supply Co., Pittsburgh, Pa.
- Duner Co., Chicago, Ill.
- Dunlay-Armand Co., Houston, Tex.
- Dunning & Co., R. B., Bangor, Maine.
- Dunwody, W. Elliott, Jr., Macon, Ga.
- Eastern Plumbing Supply Co., Inc., The, Hartford, Conn.
- Eastern Potteries, Inc., Trenton, N. J.
- Eldridge, Charles Wm., Oswego, N. Y.
- Elizabeth Plumbing & Heating Supply Co., Elizabeth, N. J.
- Eljer-California Co., Los Angeles, Calif.
- Eljer Co., Ford City, Pa.
- Elsasser, Frederick A., Union, N. J.
- Emch Mac. & Plumbing Supply, Nick, Toledo, Ohio.
- Emery Industries, Inc., Cincinnati, Ohio.
- Endicott Supply Co., Vineland, N. J.
- Engineering Systems, Inc., Chicago, Ill.
- Englewood Plumbing Supply Co., Inc., Englewood, N. J.
- Eschweiler & Eschweiler, Milwaukee, Wis.
- Esenwein & Johnson—B. Frank Kelly, Buffalo, N. Y.
- Estabrook's Sons Co., R., S. Boston, Mass.
- Fall River Steam & Gas Pipe Co., Fall River, Mass.
- Federal Huber Co., Chicago, Ill.
- Ferguson, James D., Saginaw, Mich.

- Ferguson Supply Co., Grand Rapids, Mich.
- Field & Shorb Co., The, Decatur, Ill.
- Flannagan, Eric G., Henderson, N. C.
- Fleck Co., Camden, N. J.
- Fleck-Marshall Co., Lancaster, Pa.
- Foltz & Son, Herbert, Indianapolis, Ind.
- Fords Porcelain Works, Perth Amboy, N. J.
- Frantz & Spence, Saginaw, Mich.
- Freeport Plumbing & Heating Engineers, Freeport, N. Y.
- Frey Brothers Hardware & Plumbing, Muskegon, Mich.
- Friends Hospital, Philadelphia, Pa.
- Frontier Water & Steam Supply Co., Buffalo, N. Y.
- Gall, Harry L. C., New York, N. Y.
- Galloup Pipe & Supply Co., Battle Creek, Mich.
- Gardner Bros. Co., Inc., Ellwood City, Pa.
- General Ceramics Co., Plant 2, Metuchen, N. J.
- Georgeson, Franklin T., Eureka, Calif.
- Gibb, Office of Arthur N., Ithaca, N. Y.
- Gibbons Supply Co., N. J., Dayton, Ohio.
- Globe Machinery & Supply Co., Des Moines, Iowa.
- Glustoff Co., D., Chicago, Ill.
- Grady Plumbing Co., Carbondale, Ill.
- Graf & Dellwardt, Inc., Buffalo, N. Y.
- Hahn, Stanley W., Silver Spring, Md.
- Hajoca Corporation, Philadelphia, Pa.
- Hallsted, Harry E., Hay Springs, Nebr.
- Hansen Plumbing Co., Dallas, Tex.
- Hanson & Gavin, Virginia, Minn.
- Hardison, R. E., Kiowa, Kans.
- Harper & West, Boston, Mass.
- Harris Pump & Supply Co., S. S. Pittsburgh, Pa.
- Hartford Plumbing Supply, Inc., Hartford, Conn.
- Hasness, Carlisle D., Harrisburg, Pa.
- Haxby & Bissell, Minneapolis, Minn.
- Helfensteller, Hirsch & Watson, St. Louis, Mo.
- Hellenthal Plumbing & Heating Co., Seattle, Wash.
- Helmle, Henry R., Springfield, Ill.
- Hentz, Adler & Shutze, Atlanta, Ga.
- Hess Co., Charles, New York, N. Y.
- Higgins, Charles H., New York, N. Y.
- Hirst Co., E. P., New Bedford, Mass. (In principle.)
- Hoe Supply Co., Christopher, Ill.
- Hoffman Manufacturing Co., B., Milwaukee, Wis.
- Holsman, Henry K., Chicago, Ill.
- Home Plumbing & Heating Co., Twin Falls, Idaho.
- Hood River Plumbing Co., Hood River, Oreg.
- Hooper Plumbing Co., Dallas, Tex.
- Hope, Frank L., Jr., San Diego, Calif.
- Hopkins, Albert Hart, Buffalo, N. Y.
- Hornberger, L. F., Dwight, Ill.
- Hospital Bureau of Standards & Supplies, Inc., New York, N. Y.
- Hubbard Co., The S. B., Jacksonville, Fla.
- Huckman, Ansel L., Methuen, Mass.
- Hughes Heating & Plumbing Co., Minneapolis, Minn.
- Hunt Co., R. H., Chattanooga, Tenn.
- Hunting Co., The, Rochester, N. Y., and Auburn, N. Y.
- Hussey & Son, Inc., W. H., New York, N. Y.
- "I-X-L" Pump & Mfg. Co., Inc., The, Philadelphia, Pa. (In principle.)
- Ideal Supply Co., Somerville, Mass.
- Ihler, J. P., Spokane, Wash.
- Illinois, Department of Public Works & Buildings of, Springfield, Ill.
- Illinois, University of, Department of Architecture, Urbana, Champaign, Ill. (In principle.)
- Integrity Supply, Inc., New York, N. Y.
- Interstate Hardware Co., Inc., Bristol, Tenn.
- Ittner, Inc., Wm. B., St. Louis, Mo.
- Ivey, Inc., Edwin J., Seattle, Wash.
- Jacobson Plumbing & Heating Co., A. D., Kansas City, Mo.
- James Supply Co., Chattanooga, Tenn.
- Jedlicka Bros. Co., Inc., Sayville, L. I., N. Y.
- Johnson Co., J. D., Pensacola, Fla.
- Johnson-Barker Co., Nashua, N. H.
- Johnson Hardware Co., Clarksburg, W. Va.
- Johnson Plumbing Co., Texarkana, Ark.
- Johnson, Wallwork & Dukehart, Portland, Oreg.
- Jones-Kay Co., Inc., Pendleton, Oreg.
- Kahn Associated Architects & Engineers, Inc., Detroit, Mich.
- Kahn, Inc., Samuel R., New York, N. Y.
- Kalispell Mercantile Co., Kalispell, Mont.
- Kansas City Plumbing & Heating Co., Kansas City, Mo.
- Kansas State College, Manhattan, Kans.
- Karcher & Smith, Philadelphia, Pa. (In principle.)
- Kauffman Co., A. L., Canton, Ohio.
- Keffer & Jones, Des Moines, Iowa.
- Keiser-Van Leer Co., The, Bloomington, Ill.
- Kelley, Frederic P., New York, N. Y.
- Kennard & Son, Francis J., Tampa, Fla.
- Kiefaber Co., The W. H., Dayton, Ohio.
- Kilham, Hopkins & Greeley, Boston, Mass.
- Kimball, Harry Smith, South Portland, Maine.
- Kinsey Co., H. P., Easton, Pa.
- Klink, N. S., Phoenix, Ariz.
- Knapp Supply Co., The, Muncie, Ind.
- Knight Bros. Co., Westbrook, Maine.
- Kohler Co., Kohler, Wis.

- Kohn, Robert D., & Chas. Butler, New York, N. Y.
- Kruse & Parish, Davenport, Iowa.
- Kurtz Co., L. H., Des Moines, Iowa.
- Kyle, Herbert S., Charleston, W. Va. (In principle.)
- La Crosse Plumbing Supply Co., La Crosse, Wis.
- Lang, Geo. W., Lovelock, Nev.
- Lansing Supply Co., Lansing, Mich.
- Latenser & Sons, Inc., John, Omaha, Nebr.
- Law, Law & Potter, Madison, Wis.
- Lawrie, A. G., Lake Geneva, Wis.
- Lebanon Plumbing Supply Co., Lebanon, Pa.
- Lee Co., Inc., George G., Norfolk, Va.
- Lee Hardware Co., The, Salina, Kans.
- Leighton Supply Co., Fort Dodge, Iowa.
- Lenahan, Daniel W., New York, N. Y.
- Levine, Ernest, New Brunswick, N. J. (In principle.)
- Levine, Samuel, New York, N. Y.
- Levy, Will, St. Louis, Mo.
- Liggett Drug Co., Inc., New York, N. Y.
- Lincoln Iron Works, Rutland, Vt.
- Locke Stevens, Inc., Somerville, Mass.
- Loeb, Laurence M., White Plains, N. Y.
- Long Plumbing & Heating Supply Co., Chicago, Ill.
- Lorenz Co., Klamath Falls, Oreg.
- Lycette, John J., Nashua, N. H.
- Lyon Co., A. E., Glendale, Calif., Seattle, Wash., and Portland, Oreg.
- Malone Plumbing Supply Co., S. S. Pittsburgh, Pa.
- Mamaroneck Plumbing Supply, Inc., Mamaroneck, N. Y.
- Manchester Supply Co., Manchester, N. H.
- Manley Associates, Inc., Fred, Knoxville, Tenn.
- Mansfield Sanitary Pottery, Inc., Perryville, Ohio.
- Manufacturers Selling Co., Trenton, N. J.
- Martin Metal Manufacturing Co., The Wichita, Kans.
- Mason & Co., George D., Detroit, Mich.
- Massena & duPont, Inc., Wilmington, Del.
- Masten & Hurd, San Francisco, Calif.
- Mauran, Russell, Crowell & Mullgardt, St. Louis, Mo.
- May Co., Galesburg, Ill.
- May Supply Co., Anderson, Ind.
- McAuliffe & Burke Co., Boston, Mass.
- McGowin-Lyons Hardware & Supply Co., Mobile, Ala.
- McGuire, H. J., Hornell, N. Y.
- McKaig's, Cumberland, Md.
- McMullen, C. E., Hume, Ill.
- McNeill, O. H., Herrin, Ill.
- Mechanical Construction Corporation, Hibbing, Minn.
- Meldrum, Alexander, Philadelphia, Pa.
- Merkel Brothers Co., The, Cincinnati, Ohio.
- Merrimack Valley Supply Co., Lowell, Mass.
- Meyer, F. & J., New York, N. Y.
- Michigan Supply Co., Lansing, Mich.
- Midland Plumbing Supply Co., East St. Louis, Ill.
- Milano, M. Joseph, Roslindale, Mass.
- Miller & Yeager, Terre Haute, Ind.
- Milwaukee, Bureau of Bridges & Public Buildings, Milwaukee, Wis.
- Milwaukee Plumbing & Heating Supply Co., Milwaukee, Wis.
- Mineola Plumbing Supply Co., Inc., Mineola, N. Y.
- Missoula Mercantile Co., Missoula, Mont.
- Missouri Water & Steam Supply Co., St. Joseph, Mo.
- Mitchell-Powers Hardware Co., Bristol, Va.
- Modern Plumbing & Heating Co., Grand Rapids, Mich.
- Molther, F. R., Ancon, C. Z.
- Monroe Co., Jamaica Plain, Mass.
- Montgomery, Ward & Co., Chicago, Ill.
- Mooser, William, San Francisco, Calif.
- Morgan, David H., Philadelphia, Pa.
- Morley Brothers, Saginaw, Mich.
- Mott Co. of Pennsylvania, Philadelphia, Pa.
- Muhlenberg Brothers, Reading, Pa.
- Muhlenberg, Yerkes & Muhlenberg, Reading, Pa.
- Muller, Fritz, New York, N. Y.
- Mundie, Jensen, Bourke & Havens, Chicago, Ill.
- Muntz & Lea Co., Elgin, Ill.
- Murdock Manufacturing & Supply Co., The, Cincinnati, Ohio.
- Murphy Supply Co., Green Bay, Wis.
- Nailon Corporation, Peoria, Ill.
- National City Realty Corporation, New York, N. Y.
- National Mill Supply Co., The, Fort Wayne, Ind.
- Nelson, Albert L., St. Louis, Mo.
- Nelson Co., N. O., Edwardsville Brass Works Division, Edwardsville, Ill.
- Nelson Manufacturing & Supply Co., Hutchinson, Kans.
- Neumann, Arthur, F., Plainfield, N. J.
- New Britain Plumbing Supply Co., New Britain, Conn.
- New Jersey Engineering & Supply Co., Passaic, N. J.
- New Jersey Orthopaedic Hospital & Dispensary, Orange, N. J.
- New Orleans, Inc., Better Business Bureau of, New Orleans, La. (In principle.)
- Nick, Oscar H., Erie, Pa.
- Norfolk & Western Railway Co., Roanoke, Va.
- North Philadelphia Supply Co., Philadelphia, Pa.

- Northup & O'Brien, Winston-Salem, N. C.
- Norwich Plumbing Supply House, Inc., Norwich, Conn.
- Oakland Public Schools, Oakland, Calif.
- O'Donnell, Val J., Worcester, Mass.
- Officer, Gwynn, Berkeley, Calif.
- Ohio Oil Co., The, Findlay, Ohio.
- Ohio State Supply Co., The, Youngstown, Ohio.
- Oklahoma, University of, Norman, Okla.
- Olsen & Hefferman, San Francisco, Calif.
- Oman & Lillenthal, Chicago, Ill.
- O'Neil Supply Co., Inc., M., Brooklyn, N. Y. and Allenhurst, N. J.
- Orange Memorial Hospital, Orange, N. J.
- O'Rourke Plumbing & Heating Co., W. R., Walla Walla, Wash.
- Orr, Robert H., Los Angeles, Calif.
- Osterfeld Co., The H. J., Dayton, Ohio.
- Pacific Plumbing & Heating Supply Co., San Francisco, Calif.
- Palmer Supply Co., Seattle, Wash.
- Pancoast Co., Henry B., Philadelphia, Pa.
- Parmelee, M. E., Knoxville, Tenn.
- Paterson General Hospital, Paterson, N. J.
- Patterson Co., W. S., Appleton, Wis.
- Paul Supply Co., Chicago, Ill.
- Pearce & Kerr, Baltimore, Md.
- Peck Co., Inc., Frank B., Hornell, N. Y.
- Pelletier & Son, Harvey J., Waterbury, Conn.
- Pennsylvania Hospital, Philadelphia, Pa.
- Peerless-Oklahoma Co., Oklahoma City, Okla.
- Peerless-Tulsa Co., Tulsa, Okla.
- Piers, Eber F., Ogden, Utah.
- Pepper, Geo. W., Jr., Philadelphia, Pa.
- Perth Amboy Hardware Co., Perth Amboy, N. J.
- Petter Supply Co., Henry A., Paducah, Ky.
- Phelps & Dewees & Simmons, San Antonio, Tex.
- Pierre & Wright, Indianapolis, Ind.
- Pinski Bros., Inc., Great Falls, Mont.
- Piper, F. Stanley, Bellingham, Wash.
- Pitt & Co., Walter A., Bloomfield, N. J.
- Platt & Bro., F. P., New York, N. Y.
- Plimpton & Hills Corporation, The, Hartford, Conn.
- Plumbers' Supply Co., New Bedford, Mass.
- Plumbers Woodwork Co., Algoma, Wis.
- Plumbing & Heating Selling Co., New Orleans, La.
- Plumbing & Heating Supply Co., Inc., The, Nashville, Tenn.
- Poekert, R. A., Bellevue, Pittsburgh, Pa.
- Providence Pipe & Sprinkler Co., Providence, R. I.
- Purves, Cope & Stewart, Philadelphia, Pa.
- R. & R. Plumbing Supply Corporation, Worcester, Mass.
- Raffel's Plumbing & Heating Supply House, Chicago, Ill.
- Rainear & Co., Inc., C. J., Philadelphia, Pa.
- Rains, Raymond, Louisville, Ky.
- Rapid Plumbing Co., Rapid City, S. Dak.
- Rayl Co., The, Detroit, Mich.
- Reading Foundry & Supply Co., Reading, Pa.
- Reddington Supply Co., Scranton, Pa.
- Redmond Co., The Geo., Cleveland, Ohio.
- Reeves Supply Co., Inc., Kansas City, Mo.
- Reichle Supply Co., Saginaw, Mich.
- Reid, William H., Jr., Billings, Mont.
- Reynolds, H. I., New Bedford, Mass.
- Reynolds, S. A., Lexington, Ky.
- Rhode Island Council of Women, Providence, R. I.
- Riber, George L., Detroit, Mich.
- Ries, A. G., Munhall, Pa.
- Riggs, Lutah Maria, Santa Barbara, Calif.
- Ritchie & Associates, James H., Boston Mass.
- Robbins-Gamwell Corporation, Pittsfield, Mass.
- Roberts, Inc., E. E. & Elmer C., Chicago, Ill. (In principle.)
- Roberts & Bro., Inc., J. T., Baltimore, Md.
- Roberts-Hamilton Co., Minneapolis, Minn.
- Robertshaw, Milton M., West Orange, N. J.
- Robischung-Kiesling Contracting Corporation, Houston, Tex.
- Rochester, Board of Education of, Rochester, N. Y.
- Rodgers Supply Co., McKees Rocks, Pa.
- Roe, Inc., William S., Newark, N. J.
- Roekel Co., The, Zanesville, Ohio.
- Rom Co., The Robert, Milwaukee, Wis.
- Rousseau, M. C., Cleveland, Ohio.
- Ruffing & Sons, Charles L., Pittsburgh, Pa.
- Rundle-Spence Manufacturing Co., Milwaukee, Wis.
- St. John's Hospital, Brooklyn, N. Y.
- St. Louis, Board of Education of the City of, St. Louis, Mo.
- Sales & Co., Murray W., Detroit, Mich.
- Sanitary Plumbing Co., Redlands, Calif.
- Sanitary Plumbing Supply Co., Jersey City, N. J.
- Sanitary Supply Co., Avon, N. J.
- Schafer Co., E. G., Washington, D. C.
- Schoeper Plumbing Supply Co., Inc., Buffalo, N. Y.
- Schoeppe, Edward, Philadelphia, Pa.
- Scholl, Jos., Philadelphia, Pa.

- Schroeder & Hildenbrand, Marshfield, Oreg.
 Schulzke, William H., Moline, Ill.
 Schwalm, Ralph A., Valley View, Pa.
 Seamans, H. W., East Pembroke, N. Y.
 Sears, Roebuck & Co., Chicago, Ill.
 Seashore Supply Co., Atlantic City, N. J.
 Seckinger, M. O., Savannah, Ga.
 Shanley, Geo. H., Great Falls, Mont.
 Shaw, R. W., Enid, Okla.
 Shaver, Chas. W., Salina, Kans.
 Shellady, Inc., Wm. D., Wilmington, Del.
 Sherwood Brass Works, Detroit, Mich.
 Shields Co., San Rafael, Calif.
 Shivers Plumbing Supply Co., W. M., Houston, Tex.
 Shwab, A., New York, N. Y.
 Sievert, Inc., W. J., Chicago, Ill.
 Silver & Sons, Mike, Los Angeles, Calif.
 Simpson, Inc., W. H., Olean, N. Y.
 Slaughter, R. L., Jacksonville, Fla.
 Sleeper, Harold R., New York, N. Y.
 Small Co., Inc., P. A. & S., York, Pa.
 Smith, Henry C., Independence, Mo.
 Smith Parish, Inc., Portville, N. Y.
 Smolka Co., Inc., New York, N. Y.
 Somerville Co., Thos., Washington, D. C.
 South Bend Supply Co., The, South Bend, Ind.
 Southern States Supply Co., Columbia, S. C.
 Southern Supply Co., Inc., Baltimore, Md.
 Southland Supply Co., Inc., Dallas, Tex.
 Spangler Plumbing Co., Birmingham, Ala.
 Speakman Co., Wilmington, Del.
 Specification Record, Chicago, Ill.
 Standard Pipe & Plumbing Supply Co., Kansas City, Mo.
 Standard Plumbing & Heating Co., Dumont, N. J.
 Standard Supply Co., The, Portsmouth, Ohio.
 Star Plumbing & Heating Supply Co., Yonkers, N. Y.
 Staten Island Supply Co., Inc., New York, N. Y.
 Staub & Rather, Houston, Tex.
 Sterner Co., Edwin, Flint, Mich.
 Stoetzel, Ralph E., Chicago, Ill.
 Streeter, D. D., Brooklyn, N. Y.
 Stroh & Wilson, Inc., New York, N. Y.
 Sullivan County Plumbing & Heating Supply Co., Inc., Liberty, N. Y.
 Summers Hardware & Supply Co., Johnson City, Tenn.
 Swank Hardware Co., The, Johnstown, Pa.
 Sweet's Catalog Service, New York, N. Y. (In principle.)
 Taylor, Edward Cray & Ellis Wing, Los Angeles, Calif.
 Temple, Seth J., Arthur Temple, Davenport, Iowa. (In principle.)
 Tennessee Mill & Mine Supply Co., Knoxville, Tenn.
 Thompson-Durkee Co., Allston Station, Boston, Mass.
 Thorn & Son, A. Boyd, Clearfield, Pa.
 Thorne, Henry Calder, Ithaca, N. Y.
 Thornley Supply Co., The, Pawtucket, R. I.
 Timberlake-Garner, Inc., Baltimore, Md.
 Trant & Bro., Inc., Thomas, Hartford, Conn.
 Treaty Co., The, Greenville, Ohio.
 Trenton Potteries, The, Trenton, N. J.
 Trimble & Lutz Supply Co., Wheeling, W. Va.
 Trumbull Plumbing Supply Co., Warren, Ohio.
 Trumbull Plumbing Supply Co., Youngstown, Ohio.
 Turner & Van Scoy Co., Inc., Wilkes Barre, Pa.
 Tyler, Fred W., Lincoln, Nebr.
 Tyson Bros., Mesa, Ariz.
 Union City Plumbing Supply Co., Inc., Union City, N. J.
 Universal Sanitary Manufacturing Co., New Castle, Pa.
 Van Arnam Manufacturing Co., Ft. Wayne, Ind.
 Van Camp Hardware & Iron Co., Indianapolis, Ind.
 Vandecar-Harmon Co., Albany, N. Y. (In principle.)
 Van Denberg Supply Co., Rockford, Ill.
 Virginia Polytechnic Institute, Blacksburg, Va.
 Vogel Co., John J., Boston, Mass.
 Vogel & Sons Co., P. A., Louisville, Ky.
 Wachter, Hoskins & Russell, Inc., Baltimore, Md.
 Wagner & Sons, Michael, Chicago, Ill.
 Walker, Nat Gaillard, Fort Myers, Fla.
 Walsh, Office of William Henry, Chicago, Ill.
 Wanner Bros., Baltimore, Md.
 "Warburton's," Madera, Calif.
 Washington-Eljer Co., Los Angeles, Calif.
 Weaver, Rudolph, Gainesville, Fla.
 Weber & Co., Inc., C. L., Philadelphia, Pa.
 Weekes & Son Co., John, Watertown, N. Y.
 Welch, Carroll E., Huntington, N. Y.
 Westchester Square Plumbing Supply Co., Inc., New York, N. Y.
 Western Electric Co., Inc., New York, N. Y.
 Western Supply Co., Lincoln, Nebr.
 Wheatland Co., Inc., Cedar Rapids, Iowa.
 White & Shauger, Inc., Paterson, N. J.
 Whitney & Ford Co., Chicago, Ill.
 Whittle, D. B., Palmetto, Fla.
 Wigman Co., Sioux City, Iowa.

Wilcox, Crittenden & Co., Inc., Middle-
town, Conn.
Willatsen, Andrew, Seattle, Wash.
Willson, Fred F., Bozeman, Mont.
Wischmeyer, Wm. F., St. Louis, Mo.
Wisconsin State Board of Health,
Madison, Wis. (In principle.)
Withey, Henry F., Sherman Oaks,
Calif.
Wold Co., Martin, Duluth, Minn.
Wolf, Louis G., Henderson, Ky.
Woltersdorf, Arthur, Chicago, Ill.
Wood & Son, Associates, Edward J.,
Clarksburg, W. Va.
Woodland Plumbing & Hardware Co.,
Woodland, Calif.
Woolcock Plumbing & Heating Co.,
Niagara Falls, N. Y.
Worthington Co., The George, Cleve-
land, Ohio.
Wright, Frank H., Detroit, Mich.
(In principle.)

Wright & Kremers, Inc., Niagara Falls,
N. Y.
Young, Lorenzo S., Salt Lake City,
Utah.
Zimmer Plumbing Co., H. E., Canton,
Ohio.
Zimmerman, A. C., Pasadena, Calif.
Zimmerman, Inc., Joseph, Staten Is-
land, N. Y.

U. S. GOVERNMENT

Federal Housing Administration, Wash-
ington, D. C.
Interior, U. S. Department of, Bonne-
ville Power Administration, Port-
land, Oreg.
Treasury Department, Washington, D. C.
Veterans Administration, Washington,
D. C.

COMMERCIAL STANDARDS

CS No.	Item
0-40.	Commercial standards and their value to business (third edition).
1-42.	Clinical thermometers (third edition).
2-30.	Mopsticks.
3-40.	Stoddard solvent (third edition).
4-29.	Staple porcelain (all-clay) plumbing fixtures.
5-40.	Pipe nipples; brass, copper, steel, and wrought iron.
6-31.	Wrought-iron pipe nipples (second edition). Superseded by CS5-40.
7-29.	Standard weight malleable iron or steel screwed unions.
8-41.	Gage blanks (third edition).
9-33.	Builders' template hardware (second edition).
10-29.	Brass pipe nipples. Superseded by CS5-40.
11-41.	Moisture regains of cotton yarns (second edition).
12-40.	Fuel oils (fifth edition).
13-42.	Dress patterns (third edition).
14-39.	Boys' button-on waists, shirts, junior and polo shirts (made from woven fabrics) (second edition).
15-29.	Men's pajamas.
16-29.	Wall paper.
17-42.	Diamond core drill fittings (third edition).
18-29.	Hickory golf shafts.
19-32.	Foundry patterns of wood (second edition).
20-42.	Staple vitreous china plumbing fixtures (third edition).
21-39.	Interchangeable ground-glass joints, stop-cocks, and stoppers (fourth edition).
22-40.	Builders' hardware (nontemplate) (second edition).
23-30.	Feldspar.
24-30.	Standard screw threads.
25-30.	Special screw threads.
26-30.	Aromatic red cedar closet lining.
27-36.	Mirrors (second edition).
28-32.	Cotton fabric tents, tarpaulins, and covers.
29-31.	Staple seats for water-closet bowls.
30-31.	Colors for sanitary ware.
31-38.	Wood shingles (fourth edition).
32-31.	Cotton cloth for rubber and pyroxylin coating.
33-32.	Knit underwear (exclusive of rayon).
34-31.	Bag, case, and strap leather.
35-42.	Plywood (hardwood and eastern red cedar) (second edition).
36-33.	Fourdrinier wire cloth (second edition).
37-31.	Steel bone plates and screws.
38-32.	Hospital rubber sheeting.
39-37.	Wool and part wool blankets (second edition) (Withdrawn as commercial standard, July 14, 1941).
40-32.	Surgeons' rubber gloves.
41-32.	Surgeons' latex gloves.
42-35.	Fiber insulating board (second edition).
43-32.	Grading of sulphonated oils.
44-32.	Apple wraps.
45-40.	Douglas fir plywood (domestic grades) (fourth edition).
46-40.	Hosiery lengths and sizes (third edition).
47-34.	Marking of gold-filled and rolled-gold-plate articles other than watch cases.
48-40.	Domestic burners for Pennsylvania anthracite (underfeed type) (second edition).
49-34.	Chip board, laminated chip board, and miscellaneous boards for bookbinding purposes.
50-34.	Binders board for bookbinding and other purposes.
51-35.	Marking articles made of silver in combination with gold.
52-35.	Mohair pile fabrics (100-percent mohair plain velvet, 100-percent mohair plain frieze, and 50-percent mohair plain frieze).

CS No.	Item
53-35.	Colors and finishes for cast stone.
54-35.	Mattresses for hospitals.
55-35.	Mattresses for institutions.
56-41.	Oak flooring (second edition).
57-40.	Book cloths, buckrams, and impregnated fabrics for bookbinding purposes except library bindings (second edition).
58-36.	Woven elastic fabrics for use in overalls (overall elastic webbing).
59-41.	Woven textile fabrics—testing and reporting (third edition).
60-36.	Hardwood dimension lumber.
61-37.	Wood-slat venetian blinds.
62-38.	Colors for kitchen accessories.
63-38.	Colors for bathroom accessories.
64-37.	Walnut veneers.
65-38.	Wool and part-wool fabrics.
66-38.	Marking of articles made wholly or in part of platinum.
67-38.	Marking articles made of karat gold.
68-38.	Liquid hypochlorite disinfectant, deodorant, and germicide.
69-38.	Pine oil disinfectant.
70-41.	Phenolic disinfectant (emulsifying type) (second edition) (published with CS71-41).
71-41.	Phenolic disinfectant (soluble type) (second edition) (published with CS70-41).
72-38.	Household insecticide (liquid spray type).
73-38.	Old growth Douglas fir standard stock doors.
74-39.	Solid hardwood wall paneling.
75-42.	Automatic mechanical draft oil burners designed for domestic installations (second edition).
76-39.	Hardwood interior trim and molding.
77-40.	Sanitary cast-iron enameled ware.
78-40.	Ground-and-polished lenses for sun glasses (second edition) (published with CS79-40).
79-40.	Blown, drawn, and dropped lenses for sun glasses (second edition) (published with CS78-40).
80-41.	Electric direction signal systems other than semaphore type for commercial and other vehicles subject to special motor vehicle laws (after market).
81-41.	Adverse-weather lamps for vehicles (after market).
82-41.	Inner-controlled spotlamps for vehicles (after market).
83-41.	Clearance, marker, and identification lamps for vehicles (after market).
84-41.	Electric tail lamps for vehicles (after market).
85-41.	Electric license-plate lamps for vehicles (after market).
86-41.	Electric stop lamps for vehicles (after market).
87-41.	Red electric warning lanterns.
88-41.	Liquid-burning flares.
89-40.	Hardwood stair treads and risers.
90.	(Reserved for power shovels and cranes).
91-41.	Factory fitted Douglas fir entrance doors.
92-41.	Cedar, cypress and redwood tank stock lumber.
93-41.	Portable electric drills (exclusive of high frequency).
94-41.	Calking lead.
95-41.	Lead pipe.
96-41.	Lead traps and bends.
97-42.	Electric supplementary driving and passing lamps for vehicles (after market).
98-42.	Artists' oil paints.
99-42.	Gas floor furnaces—gravity circulating type.
100-42.	Multiple-coated, porcelain-enameled steel utensils.
101-43.	Flue-connected oil-burning space heaters equipped with vaporizing pot-type burners.
102.	(Reserved for Diesel and fuel-oil engines.)

NOTICE.—Those interested in commercial standards with a view toward accepting them as a basis of everyday practice may secure copies of the above standards, while the supply lasts, by addressing the Division of Trade Standards, National Bureau of Standards, Washington, D. C.