

METRIC

DOD-B-24673
 31 July 1986
 SUPERSEDING
 MIL-B-674C
 17 February 1965

MILITARY SPECIFICATION

BELLS, SHIPS AND SMALL CRAFT

This specification is approved for use by all Departments and Agencies of the Department of the Defense.

1. SCOPE

1.1 Scope. This specification covers bells for use aboard ship and small craft.

1.2 Part identification. Bells and gongs furnished under this specification shall be of the following sizes as specified (see 6.1 and 6.2) and shall be identified by part numbers as defined below:

| <u>PART NUMBER</u> | <u>DESCRIPTION</u> |
|--------------------|--------------------|
| D24673-1 | 1.4 Kilogram bell |
| D24673-2 | 2.2 Kilogram bell |
| D24673-3 | 4.5 Kilogram bell |
| D24673-4 | 9 Kilogram bell |
| D24673-5 | 14 Kilogram bell |
| D24673-6 | 27 Kilogram bell |
| D24673-7 | 34 Kilogram bell |
| D24673-8 | 90 Kilogram bell |

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. The following specifications and standards form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Naval Sea Systems Command, SEA 55Z3, Department of the Navy, Washington, DC 20362-5101 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 6350

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SPECIFICATIONS

FEDERAL

- PPP-B-576 - Boxes, Wood, Cleated, Veneer, Paper Overlaid.
- PPP-B-585 - Boxes, Wood, Wirebound.
- PPP-B-591 - Boxes, Shipping, Fiberboard, Wood-Cleated.
- PPP-B-601 - Boxes, Wood, Cleated-Plywood.
- PPP-B-621 - Boxes, Wood, Nailed and Lock-Corner.
- PPP-B-636 - Boxes, Shipping, Fiberboard.
- PPP-B-640 - Boxes, Fiberboard, Corrugated, Triple-Wall.

STANDARDS

FEDERAL

- FED-STD-H28 - Screw-Thread Standards for Federal Service.

MILITARY

- MIL-STD-129 - Marking for Shipment and Storage.
- MIL-STD-143 - Standards and Specifications, Order of Precedence for the Selection of.

(Copies of specifications and standards required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted shall be those listed in the issue of the DoDISS specified in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS shall be the issue of the nongovernment documents which is current on the date of the solicitation.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- B 584 - Standard Specification for Copper Alloy Sand Castings for General Applications. (DoD adopted)
- D 3951 - Standard Practice for Commercial Packaging. (DoD adopted)

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.)

(Nongovernment standards and other publications are normally available from the organizations which prepare or which distribute the documents. These documents also may be available in or through libraries or other informational services.)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein (except for associated detail specifications, specification sheets or MS standards), the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

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3. REQUIREMENTS

3.1 Material.

3.1.1 Bell bodies and clappers. Bell bodies and clappers shall be copper-silicon alloy castings in accordance with ASTM B 584, Copper Alloy, UNS No. C87200. Bell castings shall be free from internal stresses or strains which may cause cracking of the bell.

3.1.2 Fittings. Fittings such as bolts, nuts, washers, pins, and supporting lugs shall be of copper-silicon alloy in accordance with ASTM B 584.

3.1.3 Selection of materials. Specifications and standards for all materials, parts, and government certification and approval of processes and equipment which are not specifically designated herein and which are necessary for the execution of this specification shall be selected in accordance with MIL-STD-143.

3.2 Construction. The construction mass, and dimensions shall conform to figures 1, 2, 3 and 4. The shape of the bodies and clappers shall be as shown on figures 1, 2, 3 and 4.

3.3 Marking. The letters "U.S" shall be cast in relief (raised) or engraved no deeper than 1 millimeter (mm) and shall conform to figures 1, 2, 3 and 4.

3.4 Finish. The exterior of the bell and the interior from the open end of the bell to the area where the clapper strikes shall have a smooth polished finish.

3.5 Acoustic properties. Bells shall have full, clear, round, and far-reaching tones as specified in table I, when examined as specified in 4.3. Tone key frequency and sound pressure requirements for 1.4 and 2.2 kilogram bells are not required; however the examination of 4.3 is required.

TABLE I. Tone keys and sound pressure levels.

| Bell mouth size (mm) | Bell mass (kg) | Tone key (approx.) | Fundamental frequency Hz (+10) | Sound pressure level (minimum) re: 2×10^{-5} pascal |
|----------------------|----------------|--------------------------|--------------------------------|---|
| 200 | 4.5 | "A" ₆ Natural | 1760 | 110 dB |
| 250 | 9.0 | "G" ₆ Natural | 1570 | 111 dB |
| 300 | 14.0 | "C" # ₆ | 1100 | 112 dB |
| 360 | 27.0 | "B" ₅ Natural | 990 | 114 dB |
| 400 | 34.0 | "A" ₅ Natural | 880 | 115 dB |
| 550 | 90.0 | "F" # ₅ | 740 | 117 dB |

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3.6 Workmanship. Surfaces, including threads, shall be free from burrs, sharp edges, and adhering sand. Materials shall be sound, of uniform quality and condition, and free from seams, cracks, and other defects which may adversely affect the strength, endurance, usefulness/serviceability, appearance or wear resistance of the part. Any material which has been treated in a manner to conceal defects therein shall not be offered for Government acceptance.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

4.1.2 Each bell shall be supported by the yoke or eyebolt with the clapper in place, and rung by striking the side of the bell with the clapper. The clapper shall be activated by a lanyard.

4.2 Acoustic properties. The tone key produced shall be determined by comparison with a tuning fork calibrated to the fundamental frequency of the bell, or by measurement of the actual frequency of the bell sound pressure levels as specified in 3.5. Table I requirements shall be determined by measurement at one meter distance from the bell.

4.3 Visual examination. While the bell is supported as specified in 4.1.2, it shall be visibly examined for compliance with the requirements of 3.1.1 through 3.6.

4.4 Inspection of packaging. Sample packages and packs, and the inspection of the preservation-packaging, packing and marking for shipment and storage shall be in accordance with the requirements of section 5 and the documents specified therein.

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5. PACKAGING

(The packaging requirements specified herein apply only for direct Government acquisition.)

5.1 Preservation. Not applicable.

5.2 Packing. Packing shall be level A, B, C or commercial, as specified (see 6.2).

5.2.1 Packing general requirements. The bells shall be cushioned, blocked, or braced within the containers in a manner to prohibit movement, and the clappers shall be secured or cushioned to prevent knocking. Unless otherwise specified (see 6.2) one bell shall be packed per container. When more than one bell is required to be packed in each container the gross mass of the wood or wood cleated boxes shall not exceed 100 kilograms (220 pounds).

5.2.1 Level A. Bells shall be packed in containers conforming to any one of the following specifications at the option of the contractor:

| <u>Specification</u> | <u>Type or class</u> |
|----------------------|----------------------|
| PPP-B-585 | Class 3 |
| PPP-B-601 | Overseas type |
| PPP-B-621 | Class 2 |

Boxes shall be closed and banded in accordance with the applicable box specification or appendix thereto.

5.2.2 Level B. Bells shall be packed in boxes conforming to any of the following specifications at the option of the contractor:

| <u>Specification</u> | <u>Type or class</u> |
|----------------------|----------------------|
| PPP-B-576 | Class 2 |
| PPP-B-585 | Class 2 use |
| PPP-B-591 | Weather-resistant |
| PPP-B-601 | Domestic type |
| PPP-B-621 | Class 1 |
| PPP-B-636 | Weather-resistant |
| PPP-B-640 | Class 2 |

Box closure and banding or reinforcement shall be as specified in the box specification or appendix thereto with method V closure applicable to PPP-B-636 boxes. The gross mass of wood or wood-cleated boxes shall not exceed 100 kilograms. Fiberboard boxes shall not exceed the gross mass (weight) of the box used.

5.2.3 Level C. Bells shall be packed as specified for level B except that the containers may be of the non weather-resistant type or grade and method I closure shall apply for PPP-B-636 boxes.

5.2.4 Commercial. Bells shall be packed in accordance with ASTM D 3951.

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5.3 Marking. In addition to any special marking required, (see 6.2), level A, B, and C shipments shall be marked in accordance with MIL-STD-129, commercial shipments in accordance with ASTM D 3951.

6. NOTES

6.1 Intended use. The ship's bells covered by this specification are intended for use on the following:

| <u>Bellmouth dia.</u> | <u>Mass weight</u> | <u>Usage</u> |
|-----------------------|--------------------|--|
| 150 and 200 | 1.4 and 2.2 | Small crafts less than 12 meters in length. |
| 200 | 4.5 | Boats 12 meters and over in length but less than 20 meters, and ships watch and fire bell. |
| 250 | 9.0 | Navy and marine craft 12 meters and over in length but less than 20 meters in length. Submarines less than 100 meters in length. |
| 300 | 14.0 | Ships and boats 20 meters and over in length but less than 50 meters. Submarines over 100 meters in length. |
| 360 | 27.0 | Ships 50 meters or over in length but less than 75 meters. |
| 400 | 34.0 | Ships 75 meters or over in length but less than 150 meters. |
| 550 | 90.0 | Ships 150 meters or over in length. |

6.2 Ordering data. Acquisition documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) Size of bell required (see 1.2).
- (c) Level of packing required (see 5.2).
- (d) Special marking required (see 5.3).

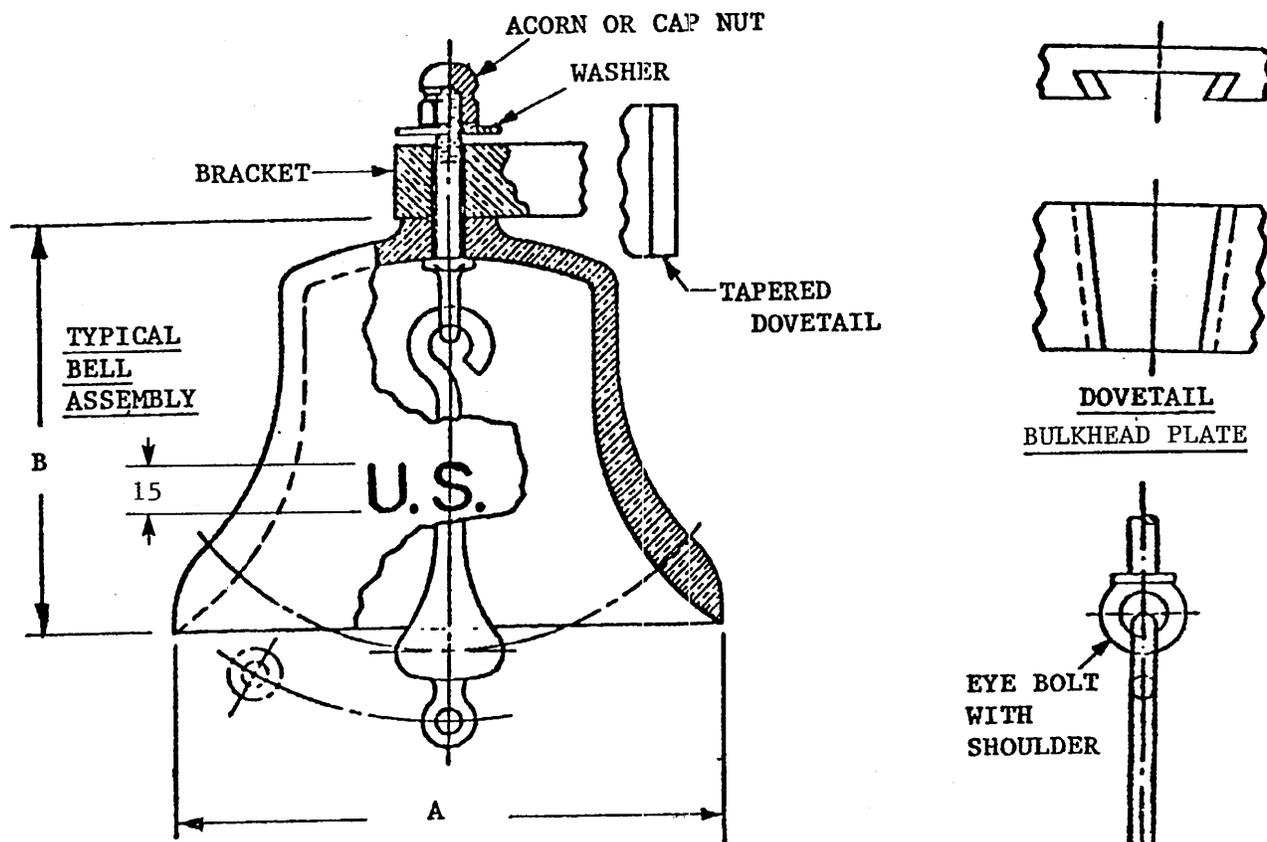
6.3 Subject term (key word) listing.

Bells
Bells castings
Gongs
Sound pressure

Custodians:
Army - ME
Navy - SH

Preparing activity:
Navy - SH
(Project 6350-0104)

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SH 13202937

TABLE II. Mass and dimensions of bells.

| Mass of bell in kilograms | Dimensions in millimeters except as noted | |
|---------------------------|---|-----|
| | A | B |
| 1.4 | 150 | 105 |
| 2.2 | 200 | 133 |

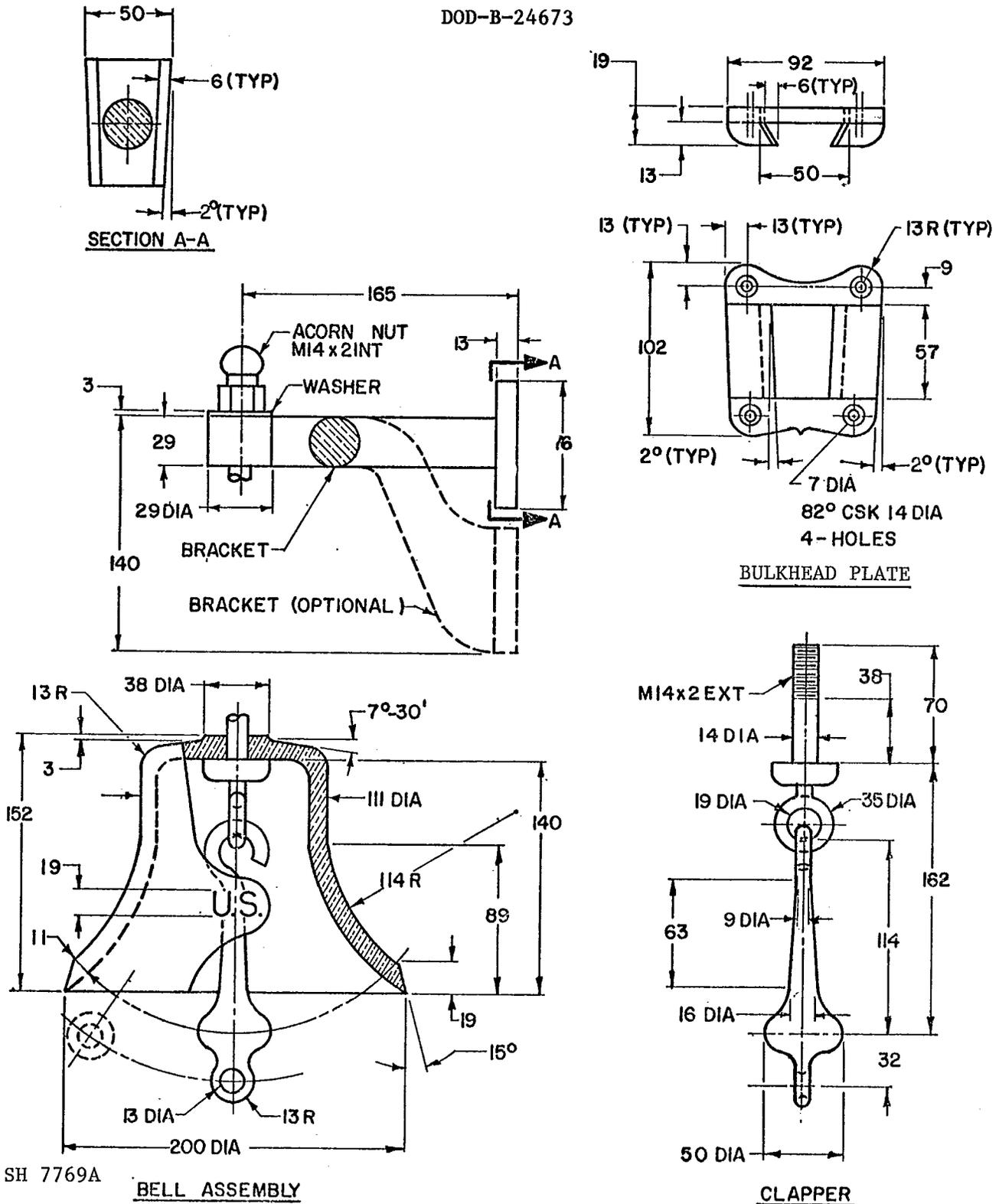
NOTES: Dimensions in millimeters. Mass of clapper to be no less than 3 percent of bell mass. Tolerance: Bell mass and clapper ± 0.2 kilogram.

Except where otherwise indicated, tolerances on dimensions less than 150 mm are ± 2 mm; over 150 mm are ± 3 mm.

Screw threads shall be in accordance with FED-STD-H28.

FIGURE 1. 1.4 and 2.2 kilogram bell.

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SH 7769A

BELL ASSEMBLY

CLAPPER

NOTE: Dimensions in millimeters. Mass of clapper to be no less than 3 percent of bell mass. Tolerance: Bell mass and clapper ± 0.3 kilogram.

Screw threads shall be in accordance with FED-STD-H28.

FIGURE 2. 4.5 kilogram bell.

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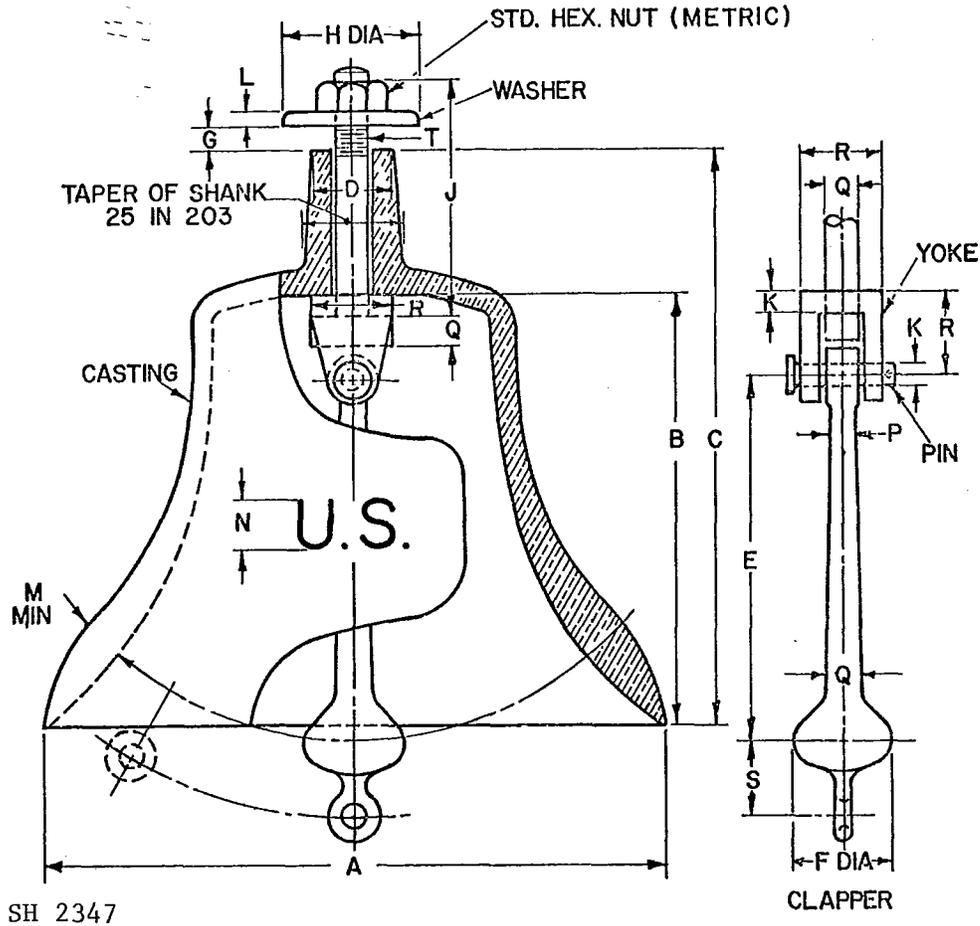


TABLE III. Mass and dimensions of bell.

| MASS OF BELL ONLY (KILOGRAMS) | | MASS OF CLAPPER (KILOGRAMS) | | DIMENSIONS IN MILLIMETERS EXCEPT AS NOTED | | | | | | | | | | | | | | | | | |
|-------------------------------|-----------|-----------------------------|-----------|---|-----|-----|----|-----|----|----|-----|-----|----|----|----|----|----|----|----|----|-----------|
| NOMINAL | TOLERANCE | NOMINAL | TOLERANCE | A | B | C | D | E | F | G | H | J | K | L | M | N | P | Q | R | S | T |
| 14 | 0.70 | 0.60 | 0.04 | 300 | 200 | 267 | 38 | 168 | 48 | 13 | 64 | 108 | 10 | 5 | 21 | 25 | 13 | 16 | 38 | 35 | M16 x 2 |
| 27 | 1.35 | 0.95 | 0.07 | 360 | 248 | 317 | 51 | 216 | 54 | 14 | 83 | 119 | 11 | 6 | 26 | 29 | 16 | 20 | 44 | 38 | M20 x 2.5 |
| 34 | 1.70 | 1.36 | 0.09 | 400 | 276 | 349 | 57 | 241 | 57 | 16 | 102 | 127 | 13 | 6 | 29 | 29 | 19 | 24 | 51 | 38 | M24 x 3 |
| 90 | 3.60 | 3.40 | 0.17 | 550 | 375 | 476 | 83 | 333 | 89 | 19 | 127 | 165 | 16 | 10 | 39 | 32 | 22 | 24 | 63 | 51 | M24 x 3 |

I. TOLERANCE ON DIMENSIONS G, K & L IS +2 MINUS 0. ALL OTHER TOLERANCES ARE AS FOLLOWS: -

| DIMENSION | LESS THAN 125 | 125 TO 250 | 250 TO 375 | 375 TO 500 | 500 TO 750 |
|-----------|---------------|------------|------------|------------|------------|
| TOLERANCE | ±2 | ±3 | ±5 | ±6 | ±10 |

NOTE: Screw threads shall be in accordance with FED-STD-H28.

FIGURE 4. 14 to 90 kilogram bell.