

इंटरनेट

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“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

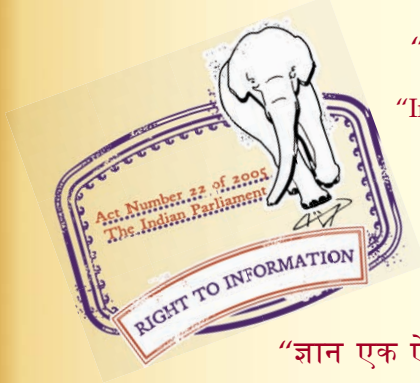
“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 8648 (1987): Ice Axe for Mountaineering [PGD 27: Mountaineering Equipment]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”



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Indian Standard
**SPECIFICATION FOR
 ICE AXE FOR MOUNTAINEERING**
(First Revision)

1. Scope — Covers the requirements of ice axes for mountaineering.

1.1 The requirement of leather covers, ring and thong have also been specified. It should be noted that these items are optional and are to be supplied only when specifically asked for.

2. Nomenclature, Size and Mass

2.1 Nomenclature and Size — See Fig. 1.

2.2 Mass

<i>Nominal Size, A</i>	<i>Maximum Mass</i>
mm	g
900	985
850	955
800	925
750	895
500	750

Note — The masses indicated above are the maximum values and every effort should be made to reduce the masses of ice axes.

3. Dimensions

3.1 Ice Axe Head, Type A — See Fig. 2.

3.2 Ice Axe Head, Type B — See Fig. 3.

3.3 Ice Axe Head, Type C — See Fig. 4.

3.4 Ice Axe Head, Type D — See Fig. 5.

Note — Subject to the agreement between the supplier and the purchaser, the ice axes of designs other than those specified in 3.1 to 3.4 may also be accepted provided they meet the safety requirements laid down in the standard.

3.5 Handle — See Fig. 6.

3.6 Ferrule — See Fig. 7.

3.7 Spike — See Fig. 8.

3.8 Thong (Complete with Ring) — See Fig. 9.

3.9 The dimensions of the leather cover shall be such as to fit the corresponding ice axe.

3.10 The tolerances on untoleranced dimensions shall be according to best manufacturing practices.

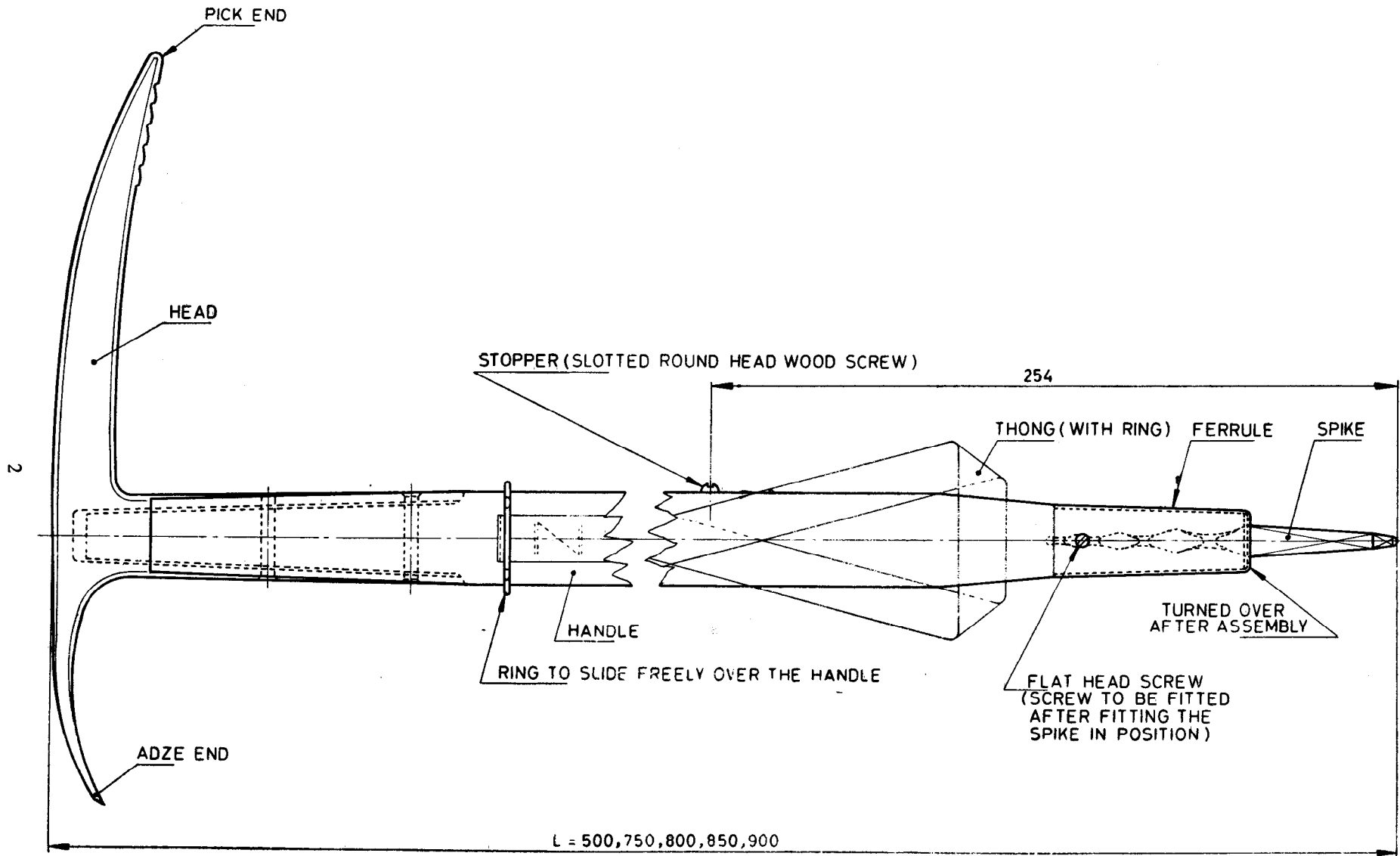
4. Material and Hardness

4.1 Head — Steel Grade 40Ni3Cr65Mo55 conforming to IS : 5517-1987 'Specification for steels for hardening and tempering (*first revision*)'. The sulphur or phosphorus content shall not exceed 0.05 percent. The head shall be evenly hardened and tempered and shall have a hardness of 350 to 450 HV.

Adopted 1 September 1987

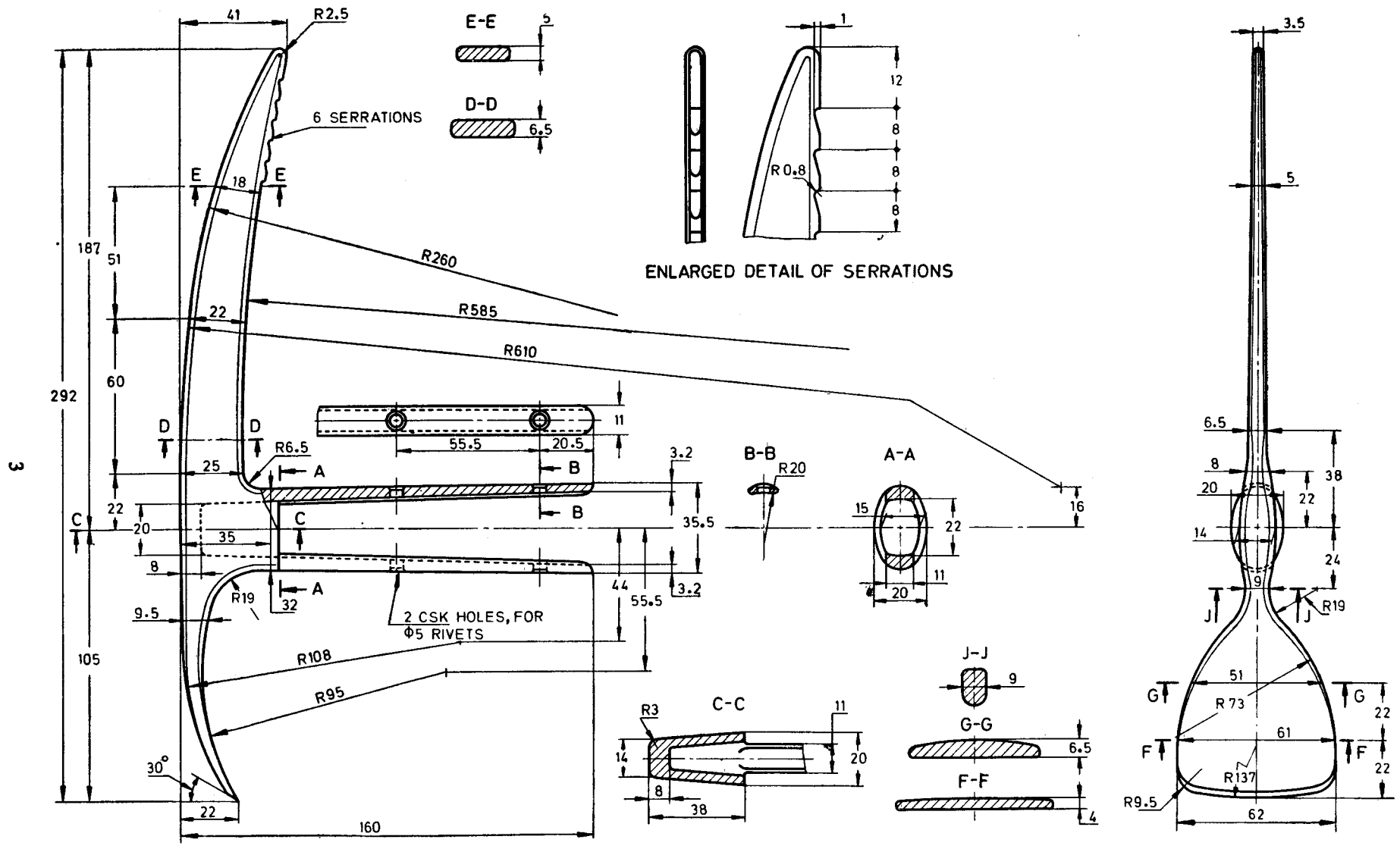
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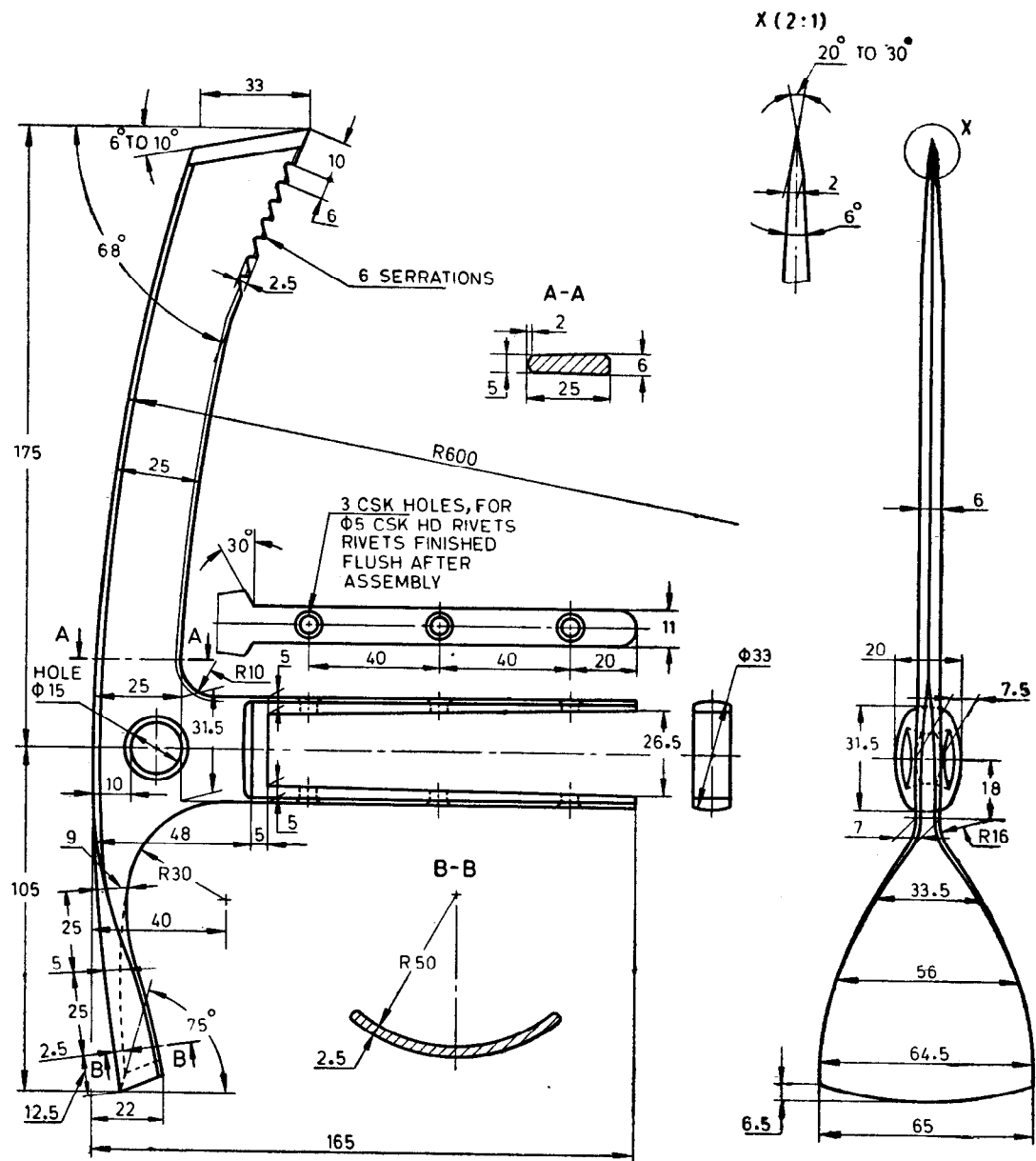
All dimensions in millimetres.

FIG. 1 NOMENCLATURE AND SIZES FOR ICE AXE



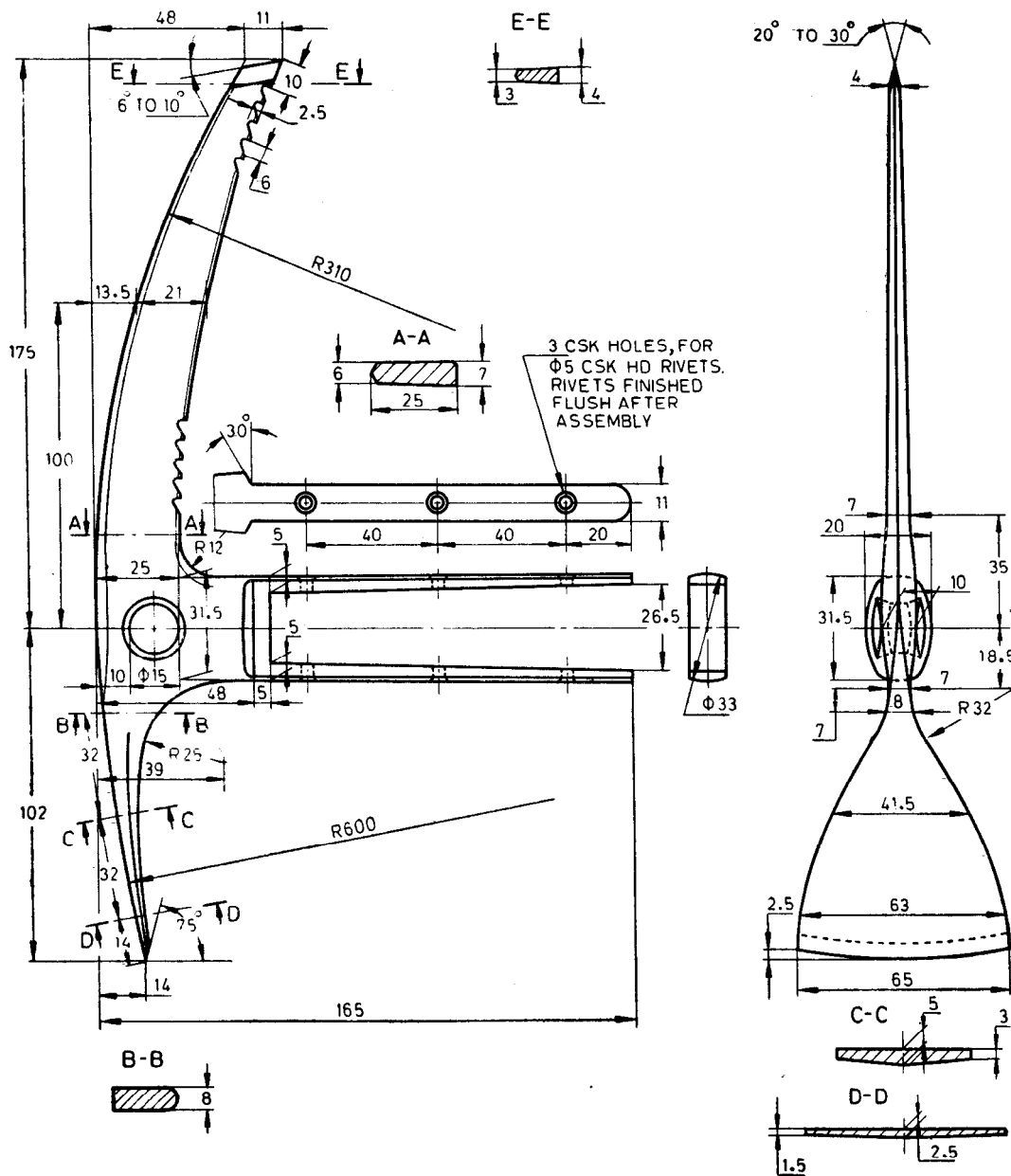
All dimensions in millimetres.

FIG. 2 DIMENSIONS FOR ICE AXE HEAD, TYPE A



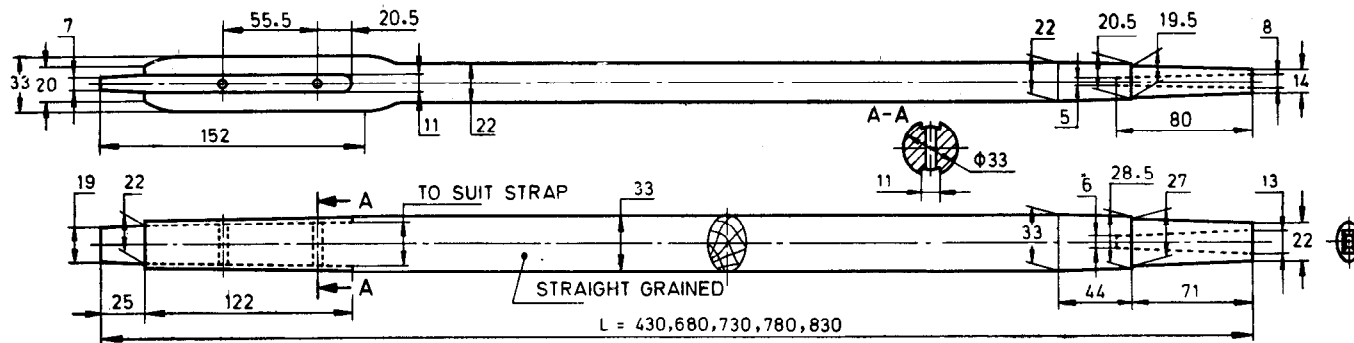
All dimensions in millimetres.

FIG. 3 DIMENSIONS FOR ICE AXE HEAD, TYPE B

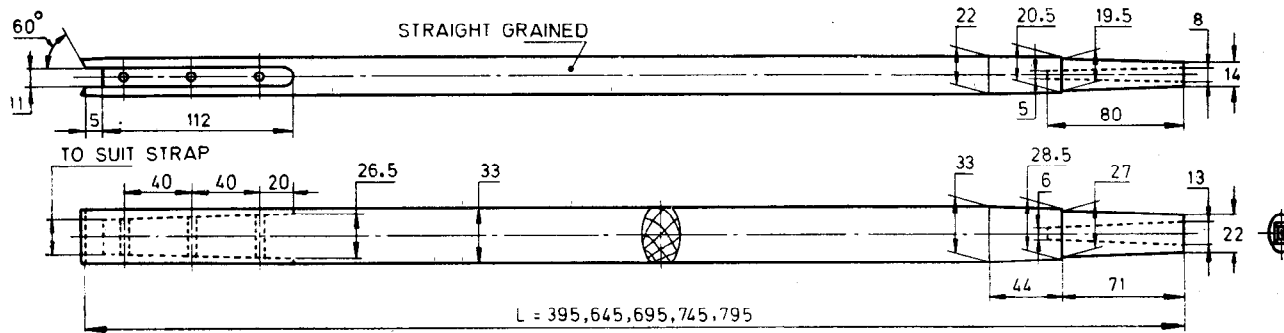


All dimensions in millimetres.

FIG. 4 DIMENSIONS FOR ICE AXE HEAD, TYPE C



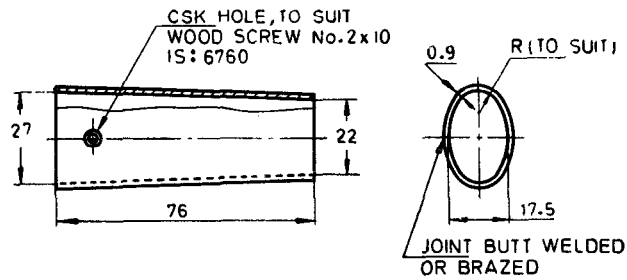
HANDLE FOR ICE AXE HEAD, TYPE A



HANDLE FOR ICE AXE HEAD, TYPES B, C AND D

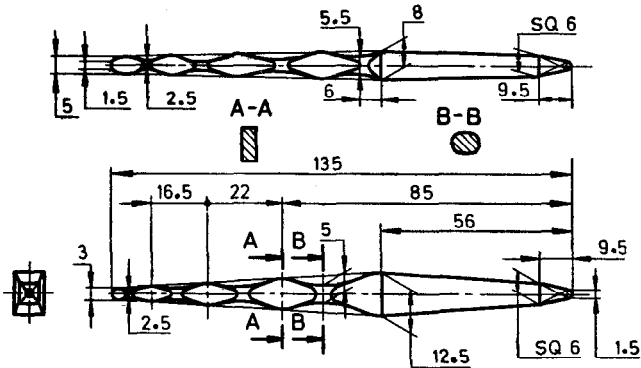
All dimensions in millimetres.

FIG. 6 DIMENSIONS FOR HANDLES FOR ICE AXE



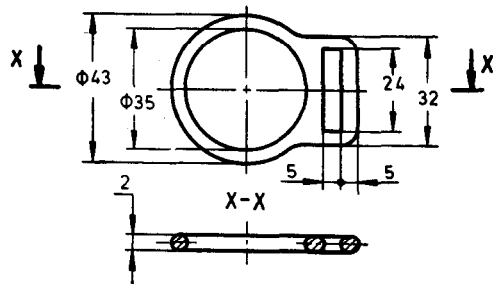
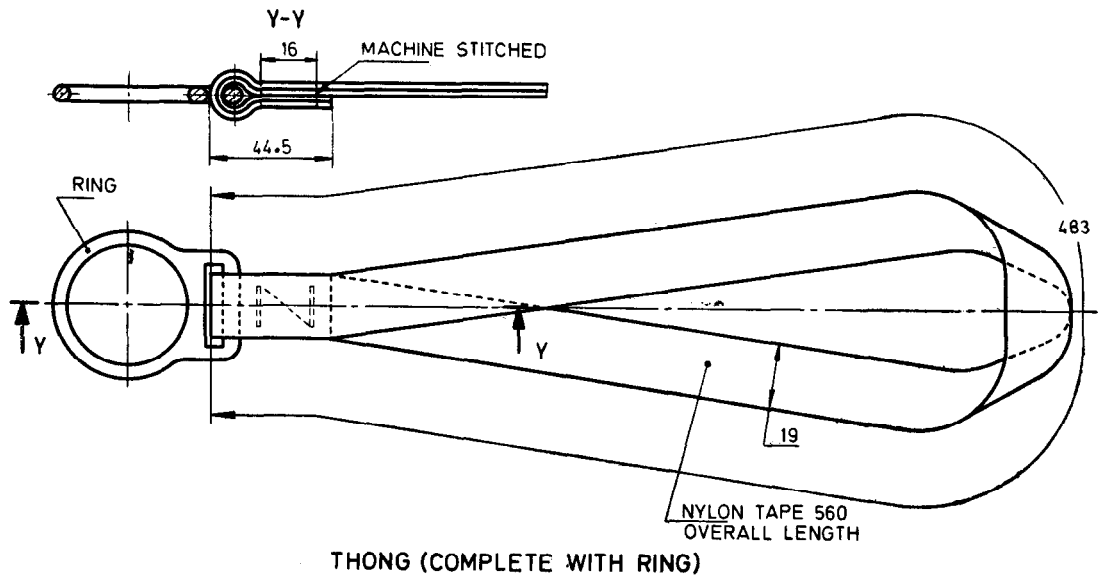
All dimensions in millimetres.

FIG. 7 DIMENSIONS FOR FERRULE



All dimensions in millimeters.

FIG. 8 DIMENSIONS FOR SPIKES



All dimensions in millimetres.

FIG. 9 DIMENSIONS FOR THONG (COMPLETE WITH RING)

4.2 Spike — Steel 40Ni3Cr65Mo55 of IS : 5517-1978. The spike shall be evenly hardened and tempered to a hardness of 350 to 450 HV.

4.3 Ferrule — Steel to Type D of IS : 513-1986 'Specification for cold rolled low carbon steel sheets and strips (*third revision*)'.

4.4 Handle — Ash or high and medium density wood-based laminates (compreg) conforming to Type V of IS : 3513 (Part 3)-1966 'Specification for high and medium density wood-based laminates (compreg) : Part 3 General purposes'.

4.5 Thong (Complete with Ring) — Thong from nylon tape with a minimum breaking strength of 1900 N (\approx 190 kgf) and ring from steel C14 of IS : 1570-1961 'Schedules for wrought steel for general engineering purposes'.

4.6 Covers — Leather buffalo curried.

4.7 Rivets — Shall conform to IS : 2155-1982 'Specification for cold forged solid steel rivets for hot closing (6 to 16 mm diameter) (*first revision*)'.

5. Manufacture

5.1 Head — The head shall be soundly forged in one piece. The rivet holes shall be countersunk to receive the rivet heads. The serrations on the pick shall be well-finished but shall not be sharp. Before assembling the handle, each head shall be subjected to crack detection test. The rivets shall be securely clinched and shall be finished flush with the surface of straps.

5.2 Spike — Spike shall be soundly forged to shape. The spike shall be forced into the taper hole at the bottom of the handle after fitting the ferrule, so that the spike shall be tight fit throughout the length of shank without splitting or weakening the handle.

5.3 Ferrule — The ferrule shall be either solid-drawn or brazed or welded. The larger end of the ferrule shall be reasonably flushed with the handle after fitting, without weakening the handle at this point. To achieve this, undercutting of the handle may be avoided and at the broad end, the inside of the ferrule may be given a small radius. The ferrule shall be further secured to the handle with the screw. The ferrule shall be tight fit and shall be driven on the end of the handle before inserting the spike.

5.4 Handle — The blank for the handle shall be quarter sawn and free from defects. The timber shall have a growth rate of 4 to 10 rings per 25 mm measured radially and the proportion of the summer wood to spring wood shall be not less than 50 percent. (The timber ash meeting these requirements is expected to have a density of more than 0.65 g per cubic centimetre at 15 percent moisture content). The timber shall be straight grained and the maximum inclination of grain and fibre shall not exceed 1 : 2 and shall be properly seasoned to a moisture content of not less than 10 percent and not more than 15 percent.

5.4.1 The handle shall be made to the shape as shown in Fig. 6 and grooves provided to accommodate the straps of the head without weakening the handle. The handle shall then be tightly fitted into the recess in the head. The straps of the head shall be snugly fitted and bedded down flush with the handle and securely riveted. Care shall be taken to ensure that rivet holes are at right angles to the growth rings of the timber. The rivets shall be countersunk and flush with the surface. After fitting, there shall be no looseness and all sharp edges and corners shall be removed. A very high standard of riveting is required to ensure that the timber of the handle is not weakened during riveting and the head is securely fitted to the handle.

5.5 Thong (Complete with Ring) — The ring of the thong shall be soundly forged. The ring shall slide freely on the handle from the under side of the head to the stopper. The tape shall be securely stitched to the ring. The stitching shall be of even tension throughout.

5.5.1 A screw shall be fitted to the candle to prevent the thong falling off the ice axe.

5.6 Head Cover — The loop to take the strap of the covers for pick end shall be sufficiently raised to take the strap easily. The covers for adze end shall be securely fitted with a one-prong buckle of nominal size 16 mm according to IS : 4274-1981 'Specification for buckles (*first revision*)'. Alternatively, the covers may be fitted with suitable instant fasteners (see also 1.1).

5.6.1 The thread used for the stitching shall be four-ply thread, flax, undyed. The thread shall be well twisted and black waxed.

6. Workmanship and Finish

6.1 The head, spike, ferrule and the rings shall be free from cracks, pits, rust, flaws, seams and other defects.

6.2 The brazing or welding of the ferrule shall be even, continuous and sound.

6.3 The tape for the thong shall be free from all weaving defects.

6.4 The leather for covers shall be neatly and smoothly rubbed down and creased. The stitching shall be of even tension throughout with all loose ends securely fastened off. The awl employed should not be too large for the thread, sewing by hook awl method is prohibited.

6.5 The rings and buckles shall be suitably oil-blackened.

6.6 The exposed surfaces of the handle shall be thoroughly waxed. The handle shall be finished smooth. The rivets shall be properly countersunk and finished flush with the surface.

6.7 All sharp edges shall be removed.

6.8 The head, ferrule and spike shall be finished bright. The head shall be protected against corrosion by using suitable grease and waxed paper or given any one of the following anti-corrosive coating:

a) Nickel and chromium plating to Service Grade No. 2 of IS : 1068-1985 'Specification for electroplated coatings of nickel plus chromium and copper plus nickel plus chromium on iron and steel (*second revision*)'.

b) Cadmium coating to Service Grade No. 2 of IS : 1572-1968 'Specification for electroplated coatings of cadmium on iron and steel (*first revision*)'.

6.9 The handle, when finished to the dimension, shall be coated at the head-end and spike-end with bituminous paint before assembly.

7. Tests

7.1 Flaw Test — The head shall be laid flat on a steel block and struck several light blows at different places with a ball peen hammer of 500 g. The test shall be repeated for the spike. There shall be no sign of damage.

7.2 Crack Test — Each head shall be subjected to crack detection test before plating or assembly.

7.3 Beam Test — The ice axe shall be supported at 40 mm from head and 40 mm from the tip of the spike, with the broad side of the handle downward. A load of 800 N (\approx 80 kgf) shall be applied downwards at the point midway between the supports. The load shall be gradual and shall be maintained for one minute. There shall be no sign of damage.

7.4 Cantilever Test — The pick-end shall be firmly held in a vice at a distance of 40 mm from the junction of the handle in such a way that the handle extends over edge of the vice but does not rest on it. A load of 300 N (\approx 30 kgf) shall be applied gradually at the junction of the ferrule and spike and maintained for one minute. There shall be no sign of damage.

7.5 Performance Test — The axe shall be held with one hand (the holder in a standing position) between the stopper and broad end of ferrule, so that the centre or the grip is 50 to 75 mm from the broad end of the ferrule and the adze end shall be struck with full force from a height of 1 m on to a mild steel plate 500 × 300 × 25 mm having a hardness 90 to 120 HV. The strike shall be such that the adze strikes roughly perpendicular to the steel plate. This test shall be repeated 12 times for the adze end. Similar test shall be conducted for the pick-end for 12 times. The spike-end shall also be struck 12 times on the same steel plate in a similar manner by holding the head.

7.5.1 After completing the above tests, the ice axe shall be thoroughly examined for sign of fracture or deformation or loosening or displacement of head and rivets or pick. There shall be no defects. The handle shall also show no sign of damage or fracture.

7.6 Impact Test — Shall be carried out at head at 40°C and shall yield 21, J Min.

8. Marking — Each ice axe shall be legibly and indelibly stamped/marked with the manufacturer's name, initials or recognized trade-mark, the year of manufacture and the size and type of the axe.

8.1 Standard Marking — Details available with the Bureau of Indian Standards.

EXPLANATORY NOTE

This standard lays down the requirements of ice axes for safe use in mountaineering. The standard was first printed in 1977. The major changes in the revision are that of the materials of head and spike and its hardness. The changes in the materials have been recommended by Research and Development Organisation, Defence Metallurgical Research Laboratory, Hyderabad after actual investigation of the imported components received from the Research and Development Estt. (Engg) as per Report 5/83. In addition impact test has been included.

The dimensions of various types of ice axes have been covered in a more detailed manner to help in manufacturing. It is intended to include additional types of ice axes of proven design at a later date. The safety requirements given in this standard are applicable to all types and sizes and the user is expected to make a choice suitable for the purposes for which the ice axe is used.