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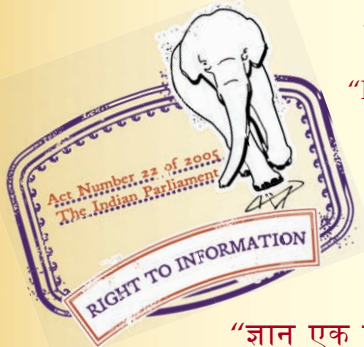
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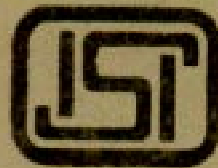
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Indian Standard
SPECIFICATION FOR
HAND OPERATED AUGERS FOR
CLEANING WATER-CLOSETS, PIPES
AND SEWERS

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SPECIFICATION FOR HAND OPERATED AUGERS FOR CLEANING WATER-CLOSETS, PIPES AND SEWERS

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Indian Standard

SPECIFICATION FOR HAND OPERATED AUGERS FOR CLEANING WATER-CLOSETS, PIPES AND SEWERS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 31 January 1979, after the draft finalized by the Public Health Engineering Equipment Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 Hand operated augers are often used for cleaning clogged water-closets, pipes and sewers. These are available in various types, classes and styles. This standard has been prepared with a view to providing guidance regarding dimensions, shape and material of such types of augers commonly employed in practice. This standard will help in variety reduction of augers.

0.3 In the formulation of this standard due weightage has been given to international co-ordination among the standards and practices prevailing in different countries in addition to relating it to the practices in the field in this country.

1. SCOPE

1.1 This standard covers requirements of materials, finish, construction, workmanship, marking and sampling of hand operated augers used for cleaning of clogged water-closets, pipes and sewers.

2. CLASSIFICATION

2.1 Types, Classes and Styles — Closet, pipe and sewer augers shall be of the following types, classes, and styles:

Type I — Auger for water-closet (*see* Fig. 1)

Type II — Auger for pipe and sewer. These are further sub-divided into the following classes and styles:

a) *Class 1* — With flexible coil spring (offset sliding handle)
(*see* Fig. 2)

- b) *Class 2* — With top snake
 - Style A — For light duty (see Fig. 3)
 - Style B — For heavy duty (see Fig. 4)
- c) *Class 3* — With flat spring steel (see Fig. 5)

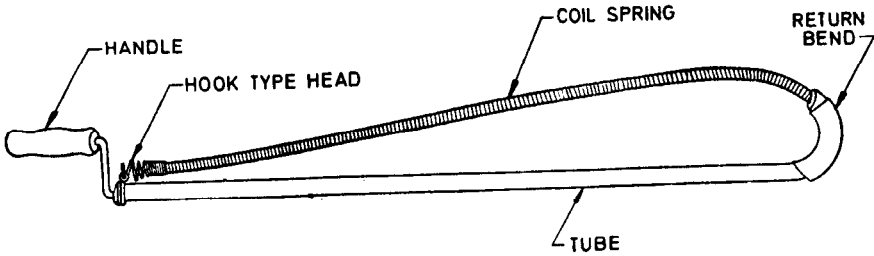


FIG. 1 TYPE I, AUGER FOR WATER-CLOSET

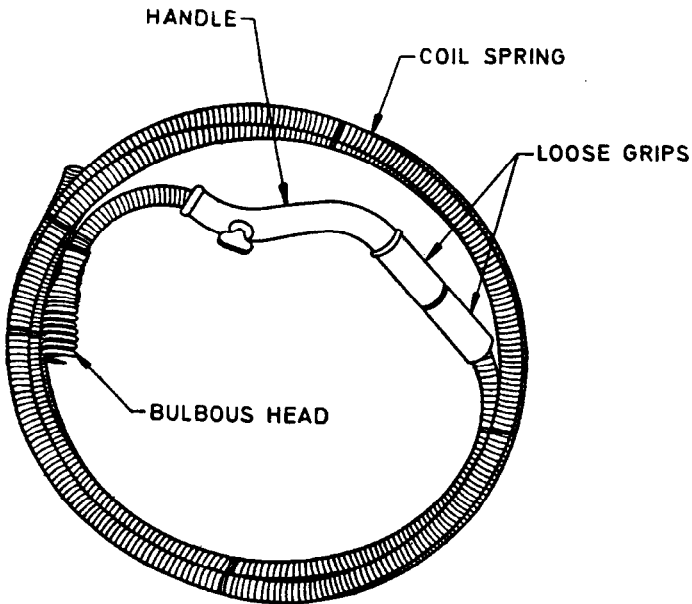


FIG. 2 TYPE II, CLASS 1, PIPE AND SEWER AUGER WITH FLEXIBLE COIL SPRING (OFFSET SLIDING HANDLE)

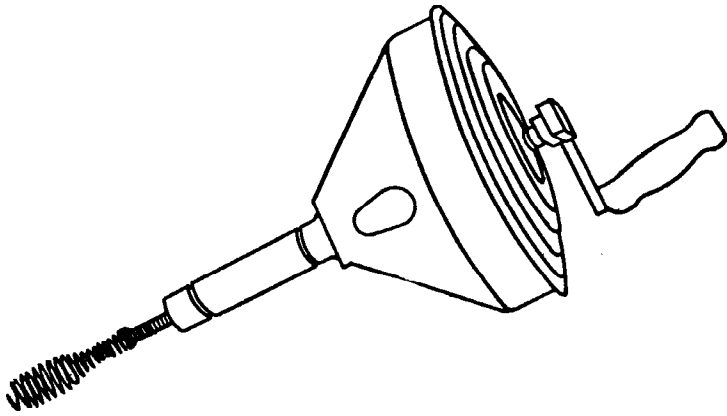


FIG. 3 TYPE II, CLASS 2, STYLE A, PIPE AND SEWER AUGER WITH TOP SNAKE, FOR LIGHT DUTY

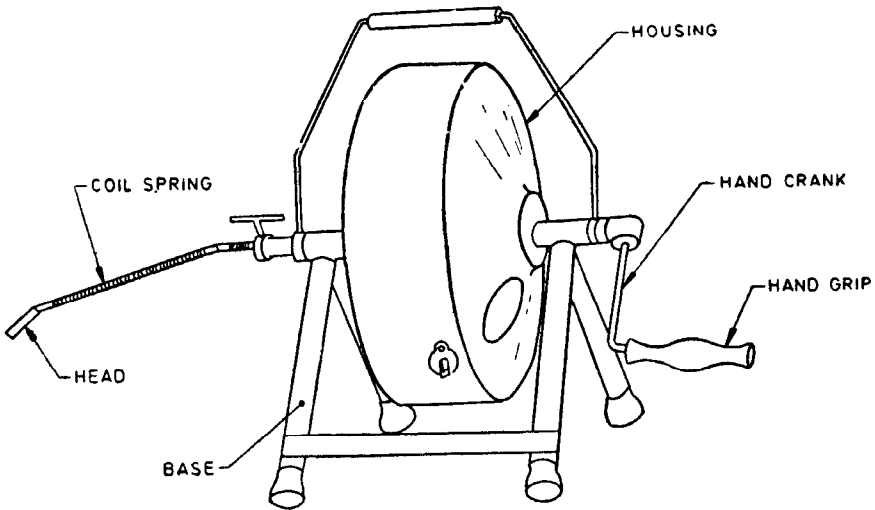


FIG. 4 TYPE II, CLASS 2, STYLE B, PIPE AND SEWER AUGER WITH TOP SNAKE, FOR HEAVY DUTY

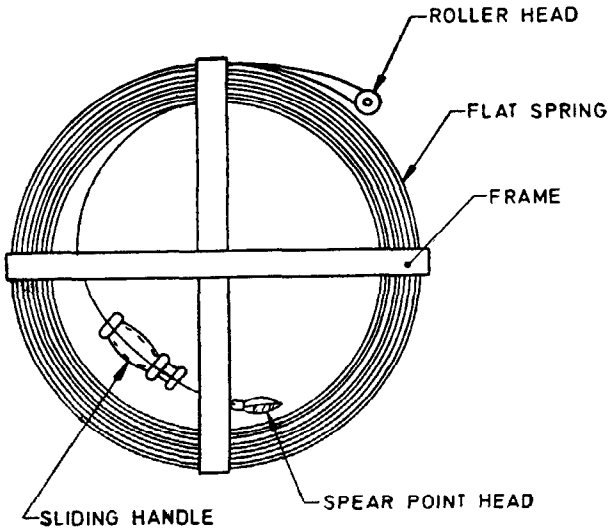


FIG. 5 TYPE II, CLASS 3, PIPE AND SEWER AUGER WITH FLAT SPRING STEEL

3. REQUIREMENTS

3.1 Material

3.1.1 Coil Springs — Coil springs shall be made of carbon steel wire conforming to Grade 2 or Grade 4 of IS : 4454 (Part I)-1975*. The spring shall be close wound with no gap in the adjacent coils.

3.1.2 Flat Springs — Flat springs shall be made of steel strips conforming to Grade 10 or Grade 11 of IS : 2507-1975†.

3.1.3 Brass Tubes — Brass tubes shall be solid drawn conforming to hard temper of IS : 407-1966‡.

3.1.4 Steel Tubes — Steel tubes shall conform to IS : 1239 (Part I)-1973§.

3.1.5 Cast Iron — Cast iron shall conform to Grade FG 150 of IS : 210-1978||.

*Specification for steel wires for cold formed springs: Part I Patented and cold drawn steel wires — unalloyed (*first revision*).

†Specification for cold-rolled steel strips for springs (*third revision*).

‡Specification for brass tubes for general purpose (*second revision*).

§Specification for mild steel tubes, tubulars and other wrought steel fittings: Part I Mild steel tubes (*third revision*).

||Specification for grey iron castings (*third revision*).

3.1.6 Aluminium Sheets — Aluminium sheets shall conform to IS : 737-1974*.

3.1.7 Mild Steel Sheets — Mild steel sheets shall conform to IS : 513-1973† or IS : 1079-1973‡.

3.1.8 Mild Steel Bars — Mild steel bars shall conform to IS : 226-1975§.

3.2 Finish

3.2.1 Springs — Coil springs and flat springs shall be smoothly finished.

3.2.2 Component Parts — Component parts made of ferrous metal, other than the coil spring, shall be smoothly finished and shall be free from sharp edges and treated to preclude corrosion.

4. CONSTRUCTION

4.1 Type I Auger for Water-Closet — It shall consist essentially of a wire coil spring, hook-type springhead, seamless brass tube, rubber or plastic bumper, fastening device, crankshaft with a handle to revolve on the crankshaft and shall be furnished with coil spring lengths of 1, 2 or 3 m. It shall be similar to Fig. 1. The requirements of various components of the auger shall be as given in 4.1.1 to 4.1.6.

4.1.1 Coil Spring — Coil springs made of steel wire conforming to Grade 4 of IS : 4454 (Part I)-1975|| shall have a wire diameter of 2.5 mm and shall be wound to 11 ± 0.5 mm outside diameter coil. Coil springs made of steel wire conforming to Grade 2 of IS : 4454 (Part I)-1975|| shall have a wire diameter of 3 mm and shall be wound to 12.5 ± 0.5 mm outside diameter coil.

4.1.2 Hook Head — The hook-type head shall be so designed that it can be removed easily and replaced with minimum effort and it shall bore through as well as entangle and remove the obstruction without becoming loose during the operation. The head may be either of the fixed or removable type. The head shall be made of the same material as used for spring.

4.1.3 Tube — The brass tube shall have a return bend to catch and hold water from spilling when removing the spring from the closet bowl.

*Specification for wrought aluminium and aluminium alloys, sheet and strip (for general engineering purposes) (*second revision*).

†Specification for cold rolled carbon steel sheets (*second revision*).

‡Specification for hot rolled carbon steel sheet and strip (*third revision*).

§Specification for structural steel (standard quality) (*fourth revision*).

||Specification for steel wires for cold formed springs: Part I Patented and cold drawn steel wires — unalloyed (*first revision*).

4.1.4 Fastening Device — There shall be a fastening device securely fastened to the handle end of the tube for holding the hook head when not in use.

4.1.5 Crankshaft — The crankshaft shall be a one-piece cold-rolled steel bar extending into the wire coil and suitably fastened in a manner to prevent mechanical failure.

4.1.6 Handle — There shall be a handle attached to the crankshaft affording a good handgrip and revolve freely on the crankshaft.

4.2 Type II Auger for Pipe and Sewer

4.2.1 Class 1, With Flexible Coil Spring (Offset Sliding Handle) — It shall consist essentially of flexible coil spring wire, cleaning head and sliding reversible handle. A typical sketch of the auger is shown in Fig. 2. The dimensions of the auger shall conform to Table 1. The requirements of various components of augers shall be as given in 4.2.1.1 to 4.2.1.3.

TABLE 1 DIMENSIONS OF TYPE II, CLASS 1 WITH FLEXIBLE COIL SPRING (OFFSET SLIDING HANDLE) AUGERS

LENGTH OF SPRINGS (Min)	WIRE DIAMETER (NOMINAL)		NOMINAL OUTSIDE DIAMETER OF COIL SPRING	
	Grade 4 Wire	Grade 2 Wire	Grade 4 Wire	Grade 2 Wire
m	mm	mm	mm	mm
3, 5, 8	1.9	2.25	6.5 ± 0.5	6.5 ± 0.5
3, 5, 8, 10, 16	2.25	3.0	9.5 ± 0.5	9.5 ± 0.5
5, 8, 10, 16, 25	3.0	3.4 to 3.8	11.0 ± 0.5	12.5 ± 0.5

4.2.1.1 Flexible coil spring — The flexible coil spring shall be of steel wire. It shall be either right hand or left hand coiled.

4.2.1.2 Cleaning head — The cleaning head shall be of the bulbous type so designed that it may be replaced, without loss of the entire spring, by cutting the spring and screwing a new head on the remaining spring. Means shall be provided so that the cleaning head will not become loose during cleaning operation. The cleaning head shall be made of the same material as used for coil spring.

4.2.1.3 Handle — The handle shall be of the reversible offset type, made of cast iron or steel tube, with either one or two loose grips of brass tube that will provide full grip for the operator's hand. The handle

shall be capable of sliding along the coil spring and gripping it tightly at any point by means of a suitable clamping method in such a manner that a pull of 450 N on the handle will not cause either slippage along the coil spring, mechanical failure of the clamping means or handle, or noticeable deformation of the spring.

4.2.2 Class 2, Top Snake

- a) *Style A (For light duty)* — It shall have the handcrank securely fastened to the cover and shall not extend beyond the outside diameter of the housing. It shall be similar to Fig. 3 and shall conform to Table 2 for the diameter and length of coil spring specified.

TABLE 2 DIMENSIONS OF TYPE II, CLASS 2, STYLE A AUGERS

LENGTH OF COIL SPRINGS <i>Min</i>	WIRE DIAMETER (NOMINAL)		NOMINAL OUTSIDE DIAMETER OF COIL SPRINGS	
	Grade 4 Wire	Grade 2 Wire	Grade 4 Wire	Grade 2 Wire
m	mm	mm	mm	mm
5, 8	1.9	2.25	6.5 ± 0.5	6.5 ± 0.5
8, 10	2.25	3.0	9.5 ± 0.5	9.5 ± 0.5

- b) *Style B (For heavy duty)* — It shall have a base, which may be set on the floor, in or upon which the housing will turn freely while being operated in an upright position. The auger shall be revolved either by a crank handle attached to the back of the container or by an independently hand-operated, fully enclosed, geared, revolver-type device attached to the coil spring. It shall be similar to Fig. 4 and shall conform to Table 3 for the diameter and length of coil spring specified.

TABLE 3 DIMENSIONS OF TYPE II, CLASS 2, STYLE B AUGERS

LENGTH OF COIL SPRINGS <i>Min</i>	WIRE DIAMETER (NOMINAL)		NOMINAL OUTSIDE DIAMETER OF COIL SPRINGS	
	Grade 4 Wire	Grade 2 Wire	Grade 4 Wire	Grade 2 Wire
m	mm	mm	mm	mm
16, 25, 30	3.0	3.8	9.5 ± 0.5	12.5 ± 0.5

4.2.2.1 Enclosed housing — The housing body shall be of aluminium sheets not less than 1 mm thick or mild steel sheets not less than 0.75 mm thick with a cover fastened securely to the housing body. Bodies made of mild steel sheets shall be heavily plated or enamelled to resist rust. All housing shall be of suitable size to accommodate the length and diameter of the coiled spring without crowding.

4.2.2.2 Handcrank — The auger shall have a handcrank of cold rolled steel bar for revolving the housing and spring. The handcrank shall be fitted with a revolving handgrip.

4.2.2.3 Locking device — The augers shall be fitted with a device for positive locking of the coil spring to the housing without permanent set or damage to the coil spring.

4.2.2.4 Coil spring — The coil spring may be either right-hand or left-hand wound. The cleaning head may be either of the fixed or removable type.

4.2.3 Class 3, Flat Spring Steel — It shall consist of a flat spring-steel auger of 16 m minimum length, 25 mm wide, 3 mm thick, one sliding metal handle, one spear point head assembled on one end, one revolving roller head assembled on the opposite end and a heavy steel frame constructed in such a manner that the auger may be coiled and stored ready for use. It shall be similar to Fig. 5.

5. WORKMANSHIP

5.1 Augers shall be free from all defects and blemishes affecting the appearance or which may impair the serviceability.

6. MARKING

6.1 Each auger shall be legibly and indelibly marked with the following informations:

- a) Name of the manufacturer or his trade-mark, if any;
- b) Type, class and style;
- c) Diameter of the coil;
- d) Material and size of the wire of the coil;
- e) Length of the coil or flat spring; and
- f) Year of manufacture.

6.2 Each auger may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

7. SAMPLING

7.1 Lot — All the augers of the same style, type and class, produced by the same manufacturer under similar conditions from similar raw materials and components shall constitute a lot.

7.2 Each lot shall be considered separately for the purpose of sampling. The samples shall be taken at random.

7.3 Sample Size and Criteria for Conformity — The size of the sample shall be as given under inspection level III of Table 1 in IS : 2500 (Part I)-1973*.

7.4 Criteria for Conformity — Each of the sample augers taken in accordance with 7.3 shall be examined to verify compliance with this specification as to completeness, rotatability, material, finish and workmanship. Examination shall be conducted for the defects mentioned below. Any auger in the sample containing one or more defects shall be rejected. The criteria for conformity shall be in accordance with the column corresponding to 4.0 percent AQL as given in Table 2 of IS : 2500 (Part I)-1973*:

- a) Type, class, style and size not as specified;
- b) Incomplete, component parts missing;
- c) Component parts materials not as specified;
- d) Coil spring broken, wire not smoothly finished;
- e) Cleaning head defective, not easily removed and replaced, or not prevented from becoming loose during service;
- f) Handle not free of sharp edges or burrs, not a comfortable grip, not free to revolve, or handle not prevented from becoming detached from crankshaft;

*Sampling inspection tables: Part I Inspection by attributes and by count of defects (first revision).

IS : 9110 - 1979

- g) Tube fastening device missing or not secure, tube not of sufficient proportions to prevent crushing, not provided with a return bend, or tube not smooth and round with square-cut ends (Type I only);
- h) Handle fails to slide on spring, clamp fails to secure handle anywhere along spring, or clamp deforms spring (Type II, Class 1 only);
- j) Enclosed housing cover not securely fastened to the body, handcrank extends beyond outside diameter of housing, locking device fails to securely hold spring, or locking device distorts or puts a permanent set in the coil spring (Type II, Class 2, Styles A and B only);
- k) Base defective, or housing fails to turn on base (Type II, Class 2, Style B only);
- m) Coil springs diameter and length not as specified;
- n) Component parts not smoothly finished, evidence of sharp edges, or parts not treated to preclude corrosion; and
- p) Auger not easily rotated; auger sticks or binds, inoperable.

(Continued from page 2)

Sewer Cleaning Equipment Subcommittee, BDC 40 : 3

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