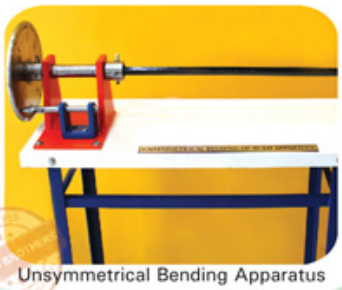
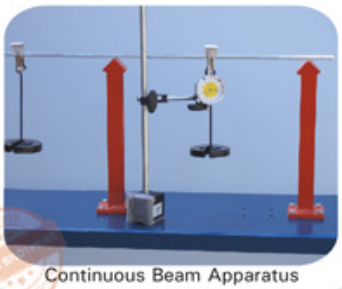
Behaviour of Column and Struts Apparatus

Curved Member Apparatus



Unsymmetrical Bending Apparatus



Continuous Beam Apparatus

Three Hinged Arch Apparatus

Ambros

STRUCTURAL MECHANICS LAB

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1700 Apparatus for Verification Of Clarke's Maxwell Reciprocal Theorem

Apparatus consist of a mild steel beam 100cm long and 1.25cm x 4mm in cross section with graduations at every 10cm along the length. It should be supported on two knife edge supports 70cm apart with a 30cm overhang on one side. Reciprocal theorem can be verified by direct measurements of the deflections of various points with the help of a dial gauge due to a load placed at the reciprocal points. A dial gauge with 25mm travel (with a magnetic base) will be supplied with the apparatus. Apparatus will be supplied complete with a supporting stand and a set of weights.

EXPERIMENTAL CAPABILITIES

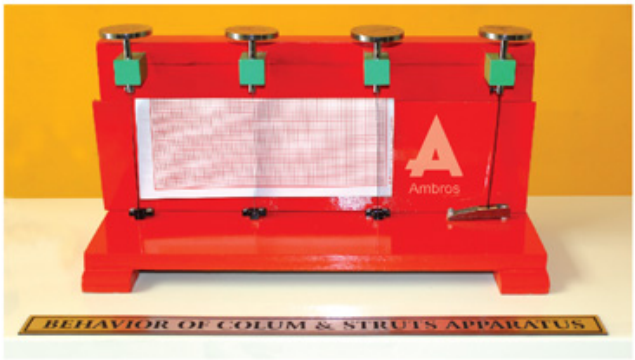
To verify Clerk's Maxwell reciprocal theorem by means of a mild steel beam

1702 Behaviour Of Column and Struts Apparatus

Apparatus consist of four spring steel columns which are put along a vertical wooden board. These four columns have different end conditions as below:

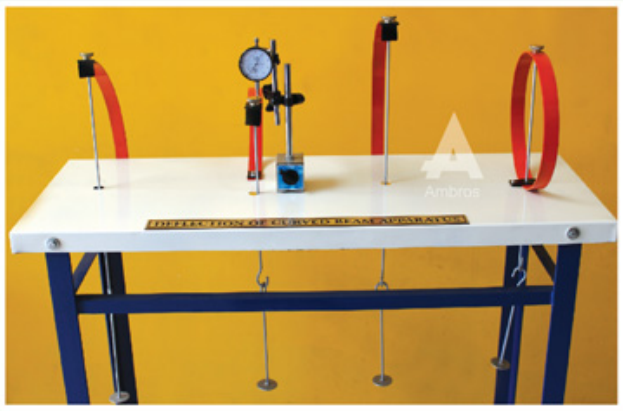
1. Both ends pinned
2. Both ends fixed
3. One end pinned and other fixed
4. One end fixed and other end free

Apparatus will be supplied complete with a supporting stand and a set of weights.



1703 Curved Member Apparatus

Apparatus consists of a steel bar which is used to make the different curved members Viz. circle, semicircle with straight arm, a quadrant of a circle and quadrant of a circle with straight arm. The bottom ends of the members are fixed to the base. Under the application of load at free end, its horizontal and vertical deflection can be measured with the help of dial gauges. A dial gauge with 25mm travel (with a magnetic base) is supplied with the apparatus. Apparatus will be supplied complete with a supporting stand and a set of weights.



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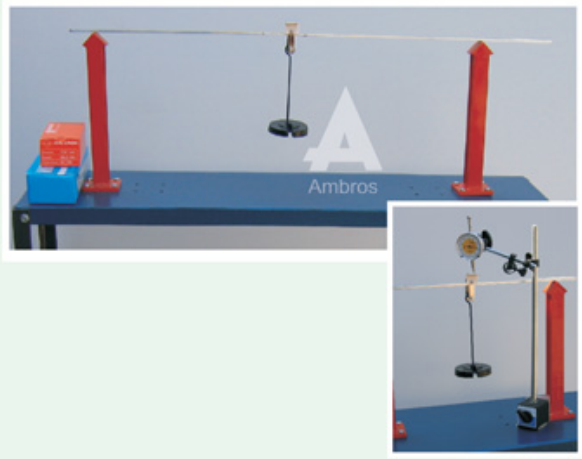
1704 Deflection Of Beam Apparatus

The bench mounted apparatus has a steel base with support at ends. The supports can be fitted with knife edges or clamp plates. A steel beam and two load hangers are supplied together with two dial gauges for measuring beam deflections and slopes.

This equipment is part of a range designed to both, demonstrate and experimentally confirm basic engineering principles. Great care has been given to each item so as to provide wide experimental scope without unduly complicating or compromising the design. Each piece of apparatus is self-contained and compact. Setting up time is minimal, and all measurements are made with the simplest possible instrumentation, so that the student involvement is purely with the engineering principles being taught. A complete instruction manual is provided describing the apparatus, its application, experimental procedure and typical test results.



1705 Elastically Coupled Beam Apparatus

Apparatus consists of a three parallel bar suspension system with elastic beam at their upper and lower ends. The upper ends of the two outer suspension rods are tied to a vertical wooden board while central suspension rod may be tied to the centre of another elastic beam supported at two outer ends only. Apparatus to be supplied should be complete with a supporting stand and a set of weights.

1706 Elastic Properties Of Deflected Beam Apparatus

Apparatus consists of a mild steel beam 2.5cm x 3mm in cross section and 100cm long, pinned to two supports 70cm apart situated symmetrically. One of the ends can be fixed or given a known slope by applying a known moment at the end with the help of suspended loads. At the other end also a known moment can be applied. Vertical loads can be applied at various points along the span of the beam. A dial gauge with 25mm travel (with a magnetic base) may be supplied with the apparatus. Apparatus to be supplied should be complete with a supporting stand and a set of weights.

1707 Three Hinged Arch Apparatus

The mild steel model has a span of 100cm and rise 25cm, with hinges at supports and crown. One of the ends rests on rollers. Along the horizontal span of the arch various points are marked at equidistant for the application of load. This being a statically determinate structure, the horizontal thrust developed under the action of any load system can be theoretically calculated and will also be measured directly by neutralizing the outward movement of the roller end. A dial gauge with 25mm travel (with magnetic base) will be supplied with the apparatus. Apparatus will be supplied complete with a supporting stand and a set of weights.

1708 Shear Centre Apparatus

Apparatus consists of sturdy base frame and Channel, Equal angle, Semicircle and Z-Section are supplied with apparatus. Standard length of each of the four sections in M. S. is supplied. Each is provided with end clamp for fixing to the rigid bracket. A special load hanger is provided so as to change the load position so that with the help of two dial-gauges, the vertical plane of Shear-centre for the particular section can be determined.

RANGE OF EXPERIMENTS

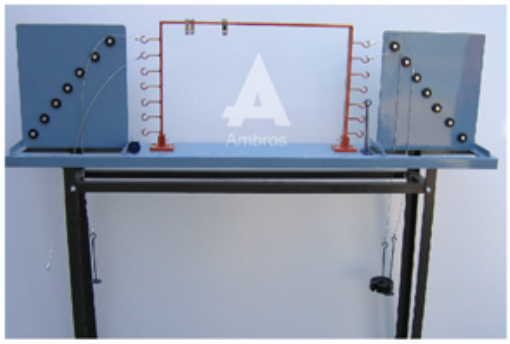
Determination of the vertical plane of shear center for different cross sections commonly used for structures.

1709 Suspension Bridge Apparatus

Apparatus Consists of two mild steel cables 0.5cm diameter in cross section and 150cm long, pinned to two supports 90cm apart situated symmetrically. One of the ends can be converted to a roller by applying a known load at the end with the help of suspended pulley system. Vertical loads can be applied at various points along the span of the beam. A dial gauge with 25mm travel (with a magnetic base) will be supplied with the apparatus. Apparatus will be supplied complete with a supporting stand and a set of weights.

1710 Portal Frame Apparatus

Apparatus made up of M.S. plate of rectangular section of 3mm thick x 40cm wide. Frame is provided with a provision to achieve different end conditions viz. hinged, roller & fixed. The size of portal will be 40cm x 60cm. Portal may also have a provision for pulley arrangement and hook arrangement for horizontal loading at different positions. A dial gauge with 25mm travel (with a magnetic base) is supplied with the apparatus. Apparatus will be supplied complete with a supporting stand and a set of weights.



1711 Redundant Joint Apparatus

Apparatus consists of three suspension members (spring balances) of different stiffness which are jointed at a point to form the redundant joint. The upper end of the suspension members being tied in a position to a vertical wooden board. Arrangement is provided to apply a vertical load at the joint and to measure its horizontal and vertical displacement on a paper and also elongations and forces in the suspension members by the help of dial gauges. Two dial gauges with 25mm travel (with magnetic bases) are supplied with the apparatus. Apparatus will be supplied complete with a supporting stand and a set of weights.

1712 Two Hinged Arch Apparatus

Apparatus has a span of 100cm and rise 25cm. Both ends should have hinge but one of the ends should also be free to move longitudinally. A lever arrangement fitted at this end for the application of known horizontal inward force for measuring the horizontal thrust. Along the horizontal span of the arch various points are marked at equidistant for the application of load. This being a statically indeterminate structure of the first degree. A dial gauge with 25mm travel (with magnetic base) will be supplied with the apparatus. Mild steel apparatus will complete with a supporting stand and a set of weights.

1713 Unsymmetrical Bending Apparatus

Apparatus consists of a mild steel angle of size 1" x 1" x 1/8" or an equivalent metric units of length 80cm is tied as a cantilever beam. The beam should be fixed at one end such that the rotation of 45° intervals are given and clamped such that the principal axis of its cross-section may be inclined at any angle with the horizontal and vertical planes. Also arrangement will be provided to apply vertical load at the free end of the cantilever and to measure horizontal and vertical deflection of the free end. A dial gauge with 25mm travel (with magnetic base) will be supplied with the apparatus. Apparatus will be supplied complete with a supporting stand and a set of weights.

1714 Pinned Joint Model

Model consists of hinged joints. Model will be able to demonstrate the qualitative behavior of the truss under load. As the members are very flexible, a compression member will easily show it's buckling i.e. it will curve out of plain. The tension member however remains straight and tight. The student will therefore have a visual picture of the type of stresses i.e. compressive or tensile that each member of truss will carry under various positions of the load. In case of pinned joint truss, the student will be able to observe that angle between members at each joint undergo a small change.

1715 Bending Moment & Shear Force App.

1716 Torsion Of Rods Apparatus

We Can Also Provide The Above Products With Digital Dial Gauge.

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