

ETHER

Engineering Education Equipments



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CATALOG

APPLIED MECHANICS

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APPLIED MECHANICS

900 UNIVERSAL FORCE TABLE (Superior)

To verify the law of conservation and resolution of forces. It consists of a machined aluminium table 40 cm. in diameter. Its raised rim has an engraved scale, graduated in 360 degrees, mounted on a vertical support rod and tripod base and provided with leveling screws. Body under study is a ring in center of the table fastened by cords passing over pulleys attached with the table. Complete with four sets of brass pulleys, lotted brass weights and weight hangers.



901 UNIVERSAL FORCE TABLE (Normal)

Same as above but with Iron nickled slotted weights and aluminium pulleys.

902 LINK POLYGON APPARATUS:

The apparatus consists of five linkages and connectors having hooks to which pans are suspended. The links are fixed between two pulleys around which a rope passes and connects to two spring balances. This apparatus is useful for the study of arches, abutments and piers. The wooden rectangular beam is supported on two pillars. A scale is fixed with beam. Without weights.



903 Apparatus to study equilibrium of non concurrent forces:

It consists of a wooden board of 50 * 60 cm, fitted with metal guides on all four edges, a rectangular sheet of hard board, two clamp pulleys, cord, one three leaf linkage lever with hooks and three iron nickled slotted weights set each set having four weights and one hanger 50 gm.

904 PARALLELOGRAM OF FORCES APPARATUS:

Consists of a wooden board of 50 x 60 cms. with wall brackets, two clamp pulleys, and three sets of iron nickel plated slotted weight sets and one hanger of 50 gms.

905 POLYGON OF FORCES APPARATUS:

Consisting of a wooden board of 75 x 70 cms size, provided with two wall brackets and four adjustable aluminium pulleys, complete with four one Kg. Weight and one scale pan.

906 TRIANGLE AND PARALLELOGRAM OF FORCES APPARATUS.

A wooden board is fixed within a slotted frame of 75x70 cms. and provided with four aluminium pulleys adjustable in the slots of the frame. The frame is provided with suitable arrangement for fixing it to wall. The unit is complete with four hangers and 16 iron nickled slotted weights of 50 gm.



907 POLYGON & TRIANGLE OF FORCES APPARATUS:

Same as above but with six pulleys and 24 iron nickled slotted weights and four hangers of 50 gms. Each.

908 Polygon of Forces Apparatus:

Consisting of 750 * 700 mm board made of soft and seasoned wood with brackets for fixing it with wall. It is supplied with following accessories. a) Six frictionless pulleys of 5 cm dia mouted with frame so that the pulley can be fixed at any position on the edges of the board. b) Six weight pans with chain, hook and string. c) A set of following weights of physical weight box of iron (duly nickled) 500 gm * 05 No., 200 gm * 05 No., 100 gm * 05 No., 50 gm * 05 No., 20 gm * 10 No., 10 gm * 10 No.

909. (A) Law of Conservation of Mass (Collision in 2-D Apparatus):- The apparatus consists of an attractive and durable curved track grooved in the middle on which rolls a steel ball, can be clamped on the table. A leveling screw is provided under the base to make the lower end of track horizontal. The track carries an adjustable automatic release system to permit setting of the ball at exactly the same starting point for multiple runs. An adjustable support attached to base holds the second ball directly in the path of the first or displaced from the path to cause the collision to occur at different angles and at different distance from the end of the track.



909 (b) Apparatus To Verify The Law of Forces in Three Dimensions:

Comprising of circular metallic ring fitted on wooden board with three pillars and provided with three spring balancing chain and hooks. But without weights.



910 PARALLEL FORCES APPARATUS(Tubular balance type):

For verification of condition of equilibrium of parallel forces on simple beam etc. Consisting of two compression thrust type 10 Kg. tubular spring balances fixed on wooden base board, a wooden beam with steel back plate. Complete with two stirrups, hooks and two 1 Kg. Weights.

911 PARALLEL FORCES APPARATUS(Dial type balance type):

Same as above but fitted with 10 Kg. Each Dial type compression balances.

912 PARALLEL FORCES APPARATUS (Overhang beam type):

This apparatus consists of two circular dial type 10 kg. Extension spring balances. Complete with iron stand, wooden beam with scale and slots at regular intervals, four stirrups, hooks and two 1 Kg. Weights.

913 Apparatus For Reactions of Forces in Beam:

It consists of: i) Two Dial type compression spring balances of 20 kg capacity each with zero adjustment device. ii) Two triangular knife edge support blocks of prismatic shape i ii) A wooden beam of about 1500mm length and 60mm * 80mm in cross section duly fitted with steel back plate and holes at rectangular stirrups.



914 BALL CRANK LEVER ON ANGLE IRON BASE (Without weights):

The apparatus consists of: i) A lever of well seasoned wood having horizontal arm 75 cm and vertical arm 20 cm. ii) A spring balance of 10kg capacity with adjustable wing nut at shorter end. iii) A set of slotted cast iron weights of 0.5 kg, one hanger the complete arrangement is mounted on steel frame.

915 BALL CRANK LEVER ON WOODEN BASE (With weight):

Same as above on wooden base and without weights.

916 COMPOUND LEVER APPARATUS (With weights):

Consists of two iron beams connected to each other and fitted on two different stands well balanced with a scale pan, fitted on suitable base. Complete with 1 Kg. Weight and a physical iron nicked weight box 1-50 gms.

917 CRANKED COMPOUND LEVER. (With weights):

All metal construction mounted on wooden base, complete with spring balance and a set of slotted weights.

918 LEVER APPARATUS. (Apparatus for verification of law of Moments)

Consisting of an aluminium graduated beam fitted into a pivoted stirrup and with spirit level on base. The top of the beam is provided with notches for weight carrying hanger. Complete with two sets of weights, each set consisting of four slotted weights and one hanger of 20gms



919 MOMENTS DISC APPARATUS (without Weights):

Consists of a balanced, machined aluminium disc rotating at its axis and can be clamped on a tripod stand in vertical plane. The disc moves on ball bearing and has a number of holes drilled symmetrically in concentric circles of known circles. . Four pins carrying scale pans can be inserted into the holes at any desired place. Complete with horizontal graduated mirror glass scale , plumb line levelling screw and 4 scale pans. .

920 LAW OF MOMENTS APPARATUS (Without Weights):

Consists of a balanced, machined aluminium disc rotating at its axis and can be clamped on a tripod stand in vertical plane. The disc moves on ball bearing and has a number of holes drilled symmetrically in concentric circles. Two pins carrying scale pans can be inserted into the holes at any desired place. Complete with horizontal graduated mirror glass scale and plumb line,



921 Cantilever Beam Apparatus:

Consists of a well seasoned wooden beam of L type shape with horizontal graduated horizontal arm 75cm and vertical arm of 20cm, with a spring balance of 10 kg capacity to make the horizontal leg horizontal under any load. Complete with one sliding slotted set weight set 100gm to 1 kg.

922. Structural Mechanism Apparatus: - It is very easy to form different trusses with the given material and find out stress in different members, the following fourteen types of models can be easily constructed:-

- (1) Single Cantilever,
- (2) Cantilever with four members
- (3) Simple Roof Truss,
- (4) Roof truss with Angled Tie Rods (Roof Truss 'A')
- (5) A Composite Frame work (Four in one frame)
- (6) King Post Roof Truss
- (7) Standard Roof Truss (Roof Truss 'B')
- (8) Roof Truss with Loads or Standard Roof Truss
- (9) Mansard Roof Truss
- (10) Island Roof Truss
- (11) N Type Girder
- (12) Warren Girder
- (13) Framed Arch.
- (14) North Light Roof Truss



923 JOINTED ROOF TRUSS ON WHEELS (Without Weights):

The apparatus is about 1.2 meter in length and strongly constructed in metal. One leg fitted on a sturdy bracket and other end moves on pair of rollers. Spring balances show tension between the rods and compression on rafters. Complete with weight hanging arrangement but without weights.

924 SHEAR LEGS APPARATUS (Without Weights):

Mounted on sturdy wooden base with provision for changing the width between legs. Complete with two tubular compression balances, one spring tension balance and scale pan.

925 SIMPLE JIB CRANE (Without Weights):

Consisting of a tubular compression balance pivoted on a bracket, fitted on base. The tie chain has an adjustable angle bracket and fitted with a 10 Kg, extension spring balance. Complete with 1.2 meter jib, fixed on a wooden base. Without weights.



926 JIB CRANE WITH IRON BASE AND TUBULAR COMPRESSION BALANCE (With Weights):

Heavy duty construction, fixed on a sturdy iron base. Consists of aluminium pipe fitted with compression balance and pivoted on sturdy bracket. The tie chain has an adjustable angle bracket and fitted with extension type 10 Kg. Spring balance. Complete with 1.2 meter jib and weights.

927 GEARED JIB CRANE (Without Weights): Strongly built, frame mounted on a heavy cast-iron base. Gears are machine cut and jib is 1.2 meter high. Complete with rope hook etc. Without weights.

928 (A) FRICTION SLIDE APPARATUS (Without Weights) SUPERIOR QUALITY:

This apparatus is used to study different laws of friction. Consists of a wooden board 75 x 15 cms. In size, with a friction-less pulley at one end and a scale pan with following accessories.

1. One set of three wooden carriages with different bottom surfaces, (Wooden, glass and iron)
2. One carriage with frictionless rollers.
3. One set of three carriages with different bottom surfaces. (Glass plate, plywood, felt cloth.)



928 (B) FRICTION SLIDE APPARATUS (Without Weights) NORMAL QUALITY:

Simple type having a wooden board 75 x 15 cms. With glass surface, a friction-less pulley at one end. Four sliding boards of different area are provided to determine the force of friction. With scale pan but without weights

929 INCLINED PLANE NORMAL QUALITY (Without weights):

It consists of a 15 x 60 cms. wooden board with glass top hinged on a base, to which a sector with graduated arc and vertical scale is attached. The plane can be clamped at any angle up-to 45 degree. A 5 cm. diameter friction-less pulley is attached at one end by means of a clamp adjustable to any required position. Complete with roller, cart and a pan but without weights



930 INCLINED PLANE SUPERIOR QUALITY (Without weights):

It consists of a 75 x 20 cms. Wooden board with glass top hinged on a base, to which a sector with graduated arc and vertical scale is attached. The plane can be clamped at any angle upto 45 degree. A 5 cm. Dia friction less pulley is attached at one end by means of a clamp adjustable to any required position. Complete with roller, cart and a pan but without weights.

931 (A) COMBINED INCLINED PLANE AND FRICTION SLIDE APPARATUS:

(With Wooden Base & without Weights)
Consisting of a wooden plane 90 x 18 cms. Having adjustment for setting the required angle. Complete with frictionless pulley, linear and circular scale, pan, a wheeled trolley and a set of eight carriages having bottom surfaces of different materials. Without weights.

931 (B) COMBINED INCLINED PLANE AND FRICTION SLIDE APPARATUS:

(With Angle Iron Base & with Weights)
Same as above but mounted on Angle Iron sturdy base and with set of weights. .



932 COIL FRICTION APPARATUS (Without Weights):

it consists of an aluminium drum and three frictionless pulleys mounted on 60 x 75 cms. wooden board. The pulleys can be fixed to give a lap of 1/4, 3/4 and full circumference of the drum. Complete with cord and two scale pans, but without weights.

933 COMBINED COIL AND FLAT BELT FRICTION APPARATUS (without Weights):

It consists of a pulley of 30 cms. Diameter with two grooves, one for rope and other for flat belt. At the back a circular sturdy wooden disc graduated at 10 degree intervals is provided. A rotating pulley is fixed at the circumference of the scale. Complete with one flat belt and a rope. The whole apparatus is mounted on a heavy vertical stand. Weights are not included.

934 COMBINED COIL AND 'V' BELT FRICTION APPARATUS (without Weights):

It consists of a pulley of 30 cms. Diameter with two grooves, one for rope and other for 'V' belt. At the back a circular sturdy wooden disc graduated at 10 degree intervals is provided. A rotating pulley is fixed at the circumference of the scale. Complete with one 'V' belt and a rope. The whole apparatus is mounted on a heavy vertical stand. Weights are not included.

935 COMBINED COIL, FLAT & 'V' BELT FRICTION APPARATUS (without Weights):

It consists of a pulley of 30 cms. Diameter with three grooves, one for rope, one for flat belt and other for 'V' belt. At the back a circular sturdy wooden disc graduated at 10 degree intervals is provided. A rotating pulley is fixed at the circumference of the scale. Complete with one flat belt, one 'V' belt and a rope. The whole apparatus

936 ROPE BRAKE DYNAMOMETER (With Weights): It consists of an aluminium machined wheel of 45 cm. dia having a groove. The wheel runs in bearings and assembled on a sturdy angle iron frame. Complete with extension balance, rope and a set of slotted weights and a hanger.

937 PRONY BRAKE DYNAMOMETER (With Weights):

It consists of two wooden blocks clamped together with a pulley in the center. The pulley runs in bearings to reduce friction. A lever bar is attached on upper block and carries a weight hanger at one end. On other end a spring balance is fitted to measure the load factor developed by tightening of wooden block with wing nuts and spring

938. Pulley Blocks: - Aluminium. 8 cm. Dia & 6 mm groove. Consisting of cast and machined aluminium pulleys moving smoothly in frame with hooks:-

(a) single, (b) double , (c) Triple

939. Pulleys Blocks:- Aluminium. 5 cm. Dia & 6 mm groove. Consisting of cast and machined aluminium pulleys moving smoothly in frame with hooks:-

(a) single, (b) double , (c) Triple

940. Pulley Blocks: - Aluminium. 8 cm. Dia & 15 mm groove. Consisting of cast and machined aluminium pulleys moving smoothly in frame with hooks:-

(a) single, (b) double , (c) Triple

941. Pulley Blocks: - Aluminium. 8 cm. Dia & 10 mm groove. Consisting of cast and machined aluminium pulleys moving smoothly in frame with hooks:-

(a) single, (b) double , (c) Triple

942 Double Sheave Pulley Block (with weights): Consisting of :i) Two parallel double pulleys of aluminium having sheave of B cm dia to 6 mm wide groove. ii) One single aluminium pulley mounted in frame with two hooks. The pulley is of 8 cm dia having 6mm. groove. iii) Two pans along with chain and hook iv) Set of conical weights. Capacity 2 kg of one of 5 kg and one of 10 kg.

942 Differential Pulley Block Model: A cast aluminium double sheave pulley block having the bigger pulley of 15 cm dia and the smaller one of 10 cm. dia mounted on sturdy cast aluminium bracket and moving freely on two steel cone bearings. A snatch pulley 5 cm diameter with groove is supplied with the unit. Without weight or cord.



944 PULLEY DEMONSTRATION SET (with Weights): Almost every type of pulley experiment can be demonstrated with this experiment. Comprising of wooden base of 100x20 cms. With two metal support stand, a horizontal bar having eight adjustable collars with hooks from which pulleys can be suspended. The following accessories for experiments are supplied along with this apparatus.

Single pulley with two hooks	7 nos.	Slotted weights 10 gms	3 nos.
Pulley Triple Long	2 nos.	Slotted weights 20 gms	3 nos.
Pulley triple parallel	2 nos.	Slotted weights 50 gms	2 nos.
Wheel and axle	1 no.	Slotted weights 100 gms	7 nos.
Capston	1 no.	Slotted weights 200 gms	4 nos.
Slotted weight hanger 50 gms.	7 nos.	Cord 20 meter	

(Slotted weights and hangers are made of iron and duly nickel plated)



945 Pulleys Systems Different Type:

(a) First system of pulleys: with four single aluminium pulleys of 5 cm dia. with string and two pans But without pulley frame and without weights.

(B) **Second System of Pulley:** With two triple long pulley (large pulley 5cm.dia middle pulley 4 cm, and small pulley 2 cm dia) aluminium with two scale pans (but without pulley frame) Without weights.

(C) **Third System of Pulley:** Having 5 cm dia four aluminium pulleys with two scale pans (without pulley frame) and without weight sets.

(d) **Pulley Frame with metal uprights but with wooden base.** Over all height about 80cm. suitable for all the above 3 experiments..

946 CHAIN PULLEY BLOCKS: (Without Weights).

(a) **Worm Gear Type.** Chain Pulley block with worm gear system for lifting of load.

(B) **Spur Gear Box Type.** Chain Pulley block with spur gear system for lifting of load.

(C) **Weston`s Differential.** Chain Pulley block with Weston`s Differential pulley system .



947 COMPOUND WHEEL & AXLE 35 CM, DIA (Without Weights):

For experimental determination of velocity ratio, mechanical advantage and comparison with calculated values for compound wheel & axle machine. The wheel is of 35 cms. Dia and axle in three steps of 20, 10 and 5 cms. Reducing diameter, supported in ball bearings in brackets. The heavy cast iron base is provided with holes for fixing the apparatus on wall. Complete with snatch pulley block, cord and hooks. Weights are not included.

948 WHEEL AND DIFFERENTIAL AXLE 30 CMS. DIA (Without Weights):

Consists of a metallic machined wheel of 30 cms. dia with axle having diameters of 15 and 7.5 cms, respectively giving a ratio of 1 :2:4. A steel axle passes through the center of the wheel which is mounted on ball bearings in brackets. The base of the apparatus has holes for fixing it on wall. Complete with snatch pulley block, cord and hooks but without weights.

949 WHEEL AND DIFFERENTIAL AXLE 20 CMS. DIA (Without Weights):

Consists of a cast iron machined wheel of 20 cms. dia with axle having diameters of 10 and 5 cms, respectively giving a ratio of 1 :2:4. A steel axle passes through the center of the wheel which is mounted on ball bearings in cast iron brackets. The base of the apparatus has holes for fixing it on wall. Complete with snatch pulley block, cord and hooks but without weights.



950 WHEEL AND AXLE SIMPLE WOODEN (Without Weights):

Consists of two wooden wheels with grooves 12 cms and 7.5 cms in diameter respectively joined together and mounted on steel centers on wooden brackets and base. Complete with cord and hooks but without weights.

951 WINCH CRAB SINGLE PURCHASE (Without Weights):

Consists of 25 cms dia cast iron gear wheel and axle in mesh with pinion wheel and effort wheel running in brackets, mounted on heavy wall brackets. This apparatus is used for experiments in efficiency and mechanical advantage. Apparatus can be mounted on wall. Without weights.

952 WINCH CRAB DOUBLE PURCHASE(Without Weights): Same as above but with double set of gearing arrangement. Without weights.

953 WORM AND WORM WHEEL (Without Weights): An all metallic apparatus useful for demonstrating the working of worm and wheel and experimental determination of velocity ratio, effort and efficiency. Consists of a machine cut worm gear 25 cms.in diameter carrying a metal drum of 12 cm. diameter and a machine cut worm on steel spindle carrying a 12 cm. diameter pulley. The whole arrangement is fixed on heavy bracket with holes for fixing to wall. Complete with effort pulley, cord and hooks. Without weights. This apparatus comes in three types.

1. Worm and worm wheel Single purchase
2. Worm and worm wheel Double purchase
3. Worm and worm wheel Triple purchase

954 WORM AND WORM WHEEL Small (Without Weights): Apparatus consisting of 80 teeth worm gear carrying a metal drum of 8 cm. Diameter, and the worm screw carrying a 8 cms. Dia pulley. Complete with string and hooks. Weights are not included.

955 APPARATUS TO FIND PERSONAL HORSEPOWER OF A MAN. It consists of a machined wheel of 45 cm. dia having a groove. The wheel runs in bearings and assembled on a sturdy angle iron frame. Complete with extension balance, rope and a set of slotted weights and a hanger. By rotating the wheel after applying the load on wheel and calculating the rpm, the H.P. Of a person can be calculated.

956 SCREW EFFICIENCY APPARATUS. (Without Weights): Consists of a self contained wall bracket with a steel screw having 3 cm, diameter. The screw has 5 T. P. I. 'V' thread. Complete with large force pulley two jockey pulleys, hooks and cords. Weights are not included...

957 SCREW JACK APPARATUS (without Weights):All metallic construction. Accurately machine cut screw with a pitch of 5 mm carrying a double flanged turn table of about 20 cms. Diameter Fitted on a heavy cast iron base and complete with two adjustable pulleys, cord and hooks. Weights are not included.

958 SCREW JACK MODEL SMALL SIZE (without Weights):It consists of a small screw jack fitted on 12 cms. diameter metal circular base, a metal precision screw having 12 cm. diameter turn-table on top, an adjustable pulley and a linear vertical scale. Overall height of the model is about 15 cms. Without weights

959 COMPOUND SCREW JACK (Without weights):Consisting of a jack screw of 4 T. P. I. And double start, carrying a load turn-table. The nut of the screw is fitted on a pedestal bearing and keyed to a worm gear of 40 teeth and mesh with a worm screw. The spindle of the worm screw is provided with an effort wheel of 15 cm diameter. Weights are not included.

960 COMPOUND SCREW JACK WITH TRANSVERSE MOTION(Without weights): Same as above but the whole unit is mounted on a sturdy slide. The slide platform is about 37 cm. long and is operated by a leading screw with a crank handle. Weights are not included.

961 DEFLECTION OF BEAM APPARATUS (without Weights):Consists of two knife edge end supports, a hanger with knife edge, and a pointer moving over a graduated scale. Complete with scale pan and two beams, one of iron and other of wood. Length of beams is 120 cms. Each. Supplied without weights.



962 BENDING OF BEAM APPARATUS (with weights): It consists of a brass beam 9 mm square one meter long resting on two knife edge end supports. A central knife edge with hanger rests on the beam at the top of which a pin is provided. Complete with cast iron slotted weight set having two weights of 1 Kg., two weights of 500 gms. and a hanger.

963. Elasticity of Fiecture Apparatus: - Consisting of nickelled steel beam one meter lo Two knife edge clamps, stirrup and scale pan, Spherometer head is mounted on a separate If desired a bell and battery circuit may be used for determining the exact contact setting. Binding post are provided for the purpose. Without weights.

964 SHEAR FORCE APPARATUS (with weights): Consisting of two knife edge end supports on stands and a wood beam 180 cms, long which is hinged at 60 cms, from one end. The dynamometer is with an adjusting screw for restoring the line line of beam under load conditions. Complete with two stirrups and weights.

965 BENDING MOMENTS APPARATUS (with weights): Consisting of wooden beam 180cms, long hinged at a distance of 60 cms. Form one end. A spring balance between two brackets is provided with an adjusting screw so as to compensate the initial extension of of the spring and to keep the beam horizontal under any load. Complete with two stirrups for weights and two knife edge end supports on stands. Weights are included.

966 STRESSES IN BEAM APPARATUS (With weights): Consists of a wood beam 180 cms. Long with two knife edge end supports on stands and two stirrups. A device with a pointer and roller fixed on a stand is provided to magnify strain and show deflection of beam due to bending. of beam. Complete with four weights of 500 gms, 1 Kg, 1.5 Kg. and 2 Kg. Each.

967 COMPRESSION OF COILED SPRINGS (Without weights): Consisting of a bracket for fixing to wall with sliding vernier and scale. Complete with five different compression springs for experiments.

968 COMBINED COMPRESSION AND EXTENSION OF SPRINGS APPARATUS (Without weights):

Consists of a cast iron bracket with sliding vernier and scale to measure extension or compression of springs. The apparatus can be fixed on a wall. Complete with three compression and three extension springs, 20 cms. Long each. Without weights.

969 HOOKS LAW APPARATUS (With weights):

Consists of 30 cms. Long mirror scale, spring, slotted weights with hanger and pointer. Complete with heavy tripod stand.

970 YOUNG'S MODULUS APPARATUS (Searl's Pattern) (without weights):

Consisting of two brass frames with specially designed self centering chucks, connected by a pivoted link carrying a sensitive spirit level and a standard micrometer head reading to 1/100 mm. Supplied with a ceiling bracket, constant weight and suitable wire. Without weights.

971 YOUNG'S MODULUS APPARATUS VERNIER TYPE (without weights):

Simple but very efficient. Consisting of 10 cm. Brass scale and vernier to read 0.1 mm with slide. Complete in case with wire. Ceiling attachment and constant cast iron weight.

973 RIGIDITY OF WIRES APPARATUS: Wire under test is connected to two brass rods 30 cm. Long at their mid point. Complete with three test wires and end screws. Rods are suspended from hooks fitted o a steel plate.

974 MAXWELL VIBRATION NEEDLE: For experiment on rigidity. Two solid and two hollow cylinders each 10 cm .long accurately fitting the bore of a hollow brass tube 40 cm. Long are provided. The tube is also fitted with wire chuck and mirror. Graduated scales and verniers on sliding weights. Complete with ceiling attachment.



975 TORSION APPARATUS CLAMP PATTERN (Without weights):The Unit consists of two heavy clamps, one of which is fitted with a wheel graduated in 90-90 degrees and can be read to 0.1 degree by a vernier device. A concentric chuck is also fitted with the wheel. The other bracket carries a chuck provided with three nipping screws. Complete with 4 rods of 6mm, 8mm, 9.5 mm and 12.5 mm diameters, hook and belt. Without weights.



976 TORSION APPARATUS SEARLE'S TYPE (without Weights):Horizontal bench pattern. The wheel moving on ball bearings is provided with a chuck. To hold the rod under test. The other end of rod is clamped tightly to a bracket. The pointers and scales are graduated in single degree and can be clamped at any position. Complete with ribbon, hook and rods of steel and brass. Without weights.

977 TORSION APPARATUS VERTICAL TYPE (without Weights): A steel frame mounted on heavy cast iron base with leveling screws. Upper end of the rod under test is held in a centering chuck and the lower end is clamped into the axis of a torsion drum which can be rotated by putting load in the scale pan passing over two frictionless pulleys. Freely sliding three circular scales graduated in degrees can be clamped at any position. Three pointers for clamping to the test rods are provided. Complete with three test rods, strings, and two scale pans. Without weights.



979 SIMPLE PENDULUM:

Brass ball of 25 mm diameter with a hook and cord.

980 BAR PENDULUM OR COMPOUND PENDULUM:

Consisting of steel bar 100 cm. Long bored at equal intervals with two removable knife edges and a wall bracket.

981 KATER'S REVERSIBLE PENDULUM: Consisting of 120 x 1.2 cm brass bar with pointed ends, carrying two sets of adjustable knife edges and two large and small brass weights. Two similar hard wood weights are provided. Complete with cast iron wall bracket.

982 MOMENT OF INERTIA OF FLYWHEEL (without Weights): Consists of a machined and balanced cast iron wheel having steel spindle supported in ball bearings in strong brackets. The wheel circumference is marked with a horizontal reference line. A pointer is provided on one of the bracket. A diametric hole is drilled in the shaft to take a pin and a cord. The base is provided with holes for fixing on the wall. Complete with hook and cord. But without weights.



1. Wheel 15 cms. Diameter
2. Wheel 20 cms. Diameter
3. Wheel 25 cms. Diameter
4. Wheel 30 cms. Diameter

983 MOMENT OF INERTIA OF FLYWHEEL (without Weights). Same as above.

- (a) Wheel 37 cms. Diameter
(b) Wheel 45 cms. Diameter

984 FLETCHER TROLLEY (with Weights) All metal, can be assembled and dismantled easily. A large metal trolley with removable cylindrical weights is fitted with wheels which move with very little friction on a track of two steel rods 150 cms. Long. The rail rods are held in heavy clamps which are fitted in two vertical rods, mounted on cast iron feet. A steel vibrator is fitted to one of the vertical rods and frictionless pulley to the other. The apparatus is capable to verify law under different conditions. Complete with cord scale pan and pen.



985 ATWOOD MACHINE:

Consisting of full length brass upright graduated pipe upto 200cm, can be mounted vertically near a wall by means of two brackets. A light weight frictionless weight of 10 cm. Diameter is mounted at it's top. Three adjustable clamps move along the rod, upper carrying a ring and lower carrying a platform and the third one is equipped with electric release system. The unit is all metallic and complete with two sets of falling weights and rider weights.



986 Stop Watch.

(a) Digital

(b) Mechanical

987 Center of Gravity Apparatus: It is consisting of the following;

a) A supporting frame with a board fixed on it for hanging lamina of different shapes. Complete with plumb bob, hanging pin and m.s. Sheet laminas of triangular, rectangular circular,, semicircular and square shapes one each with holes for hanging.

988. Centrifugal Force Apparatus: - With this trouble free unit mathematical expression for the centripetal force developed by a body moving uniformly in circular motion can be verified with good precision. In this design two masses moving on ball bearing are carefully pre-portioned so that equilibrium can be obtained at moderate speed. Complete with revolution counter, specially made spring dynamometer and with hand rotating device.



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