

MARIETTA APPARATUS COMPANY
 Psychological Equipment
 MARIETTA, OHIO

V1001	Standard Lamp	V3001	Spectroscope
V1002	Carbon Arc Lamp	V3003	Spectroscope
V1003	Neon Lamps	V3004	Spectroscope
V1004	Spectrum Tubes	V3005	Replica Grating Spectroscope
V1005	Spectrum Tubes	V3006	Absorption Band Plates
		V3010	Double Replica Crossed Gratings
V1101	Optical Disk		
		V3101	H.B. & S. Demonstrator
V1201	Neutral Tint Filters	V3201	Lambert's Color Mixing Box
V1202	Neutral Tint Wedges	V3202	Conventional Color Shadow Board
V1203	Monochromatic Filters	V3203	Binocular Color Mixing Cards for Stereoscope
V1204	Monochromatic Filters	V3204	Binocular Red and Green Mixer
V1208	Red, Green & Blue Filters	V3206	Maxwell Disk Rotator
V1210	Colored Gelatine	V3207	Maxwell Disk Rotator
V1211	Mazda to Daylight Filter	V3208	Differential Rotator, Marietta Type
V1212	Stereo Red and Green Filters	V3209	Differential Rotator, Diel
V1214	Set of Dichroic Filters		
V1215	"Subjective Yellow" Dye	V3301	Simultaneous Induction Cards
V1301	Color Disks-Paper	V3303	Simultaneous Induction Disks
V1302	Color Disks-Cardboard	V3304	Negative After-Image Cards
V1303	Color Disks-Celluloid	V3306	Benham Disk
V1305	Colored Yarns	V3307	Hering's Contrast Box
V1306	Black Celluloid Sheets	V3305	After Image Apparatus
V1307	White Celluloid Sheets	V3401	Threshold Disks
V1309	Magnesium Block	V3402	Simple Masson Disk
V1310	Magnesium Ribbon		
V1311	Black Box	V4001	Optical Bench
V1315	Brightness Scale.	V4002	Lummer-Brodhun Photometer Box
V2001	Anatomical Model of Eye	V4003	Bunsen Photometer
V2002	Charts of Eye	V4004	Polarizing Photometer
V2005	Skioscopic Eye	V4009	Sector Disk (Rotating Rhomboid Prisms)
V2006	Kuehne Eye Model	V4010	Foot Candle Meter
V2007	Blind Spot Cards	V4011	Flicker Photometer
V2009	Knapp's Ophthalmotrope	V4013	Spectrometer
V2010	Eye Movement Mirror	V4014	Spectrometer
V2011	Wink Reflex Apparatus	V4015	Standard Spectrophotometer
V2012	Phacoscope	V4017	Photochromatic Interval Apparatus
V2016	Chromatic Aberration Apparatus	V5001	Peter's Hand Campimeter
V2017	Bezold Figure Card	V5002	Carr's Campimeter
V2018	Irradiation Card	V5003	Schweigger Perimeter
V2019	Helmholtz Checker Board	V5006	Perimeter Charts
V2020	Isoscope	V5007	Registering Perimeter
V2021	Acuity Charts	V5008	McHardy Perimeter
V2022	Astigmatic Charts	V5009	McHardy Electric Perimeter
V2023	Heterophoria Test	V5010	Marietta Perimeter
V2024	Trial Frame		
V2025	Trial Frame	V6001	Monochromatic Colorimeter
V2026	Lenses, Cylinders and Prisms	V6002	Dichromatic Colorimeter
V2027	Simple Retinoscope	V6003	Trichromatic Colorimeter, Additive Type
V2028	Electric Retinoscope		
V2029	Loring Ophthalmoscope		
V2030	Electric Ophthalmoscope		
V2031	Ophthalmometer		

V6004	Trichromatic Colorimeter, Subtractive Type	V8120	Lenticular Pseudoscope
V6005	Standard Spectrophotometer	V8121	Stereoscopic Cards
V6006	Marietta Color Analyzer	V8201	Illusion Cards
V7001	Donder's Test	V8202	Arrow Head Illusion Board
V7002	Scripture's Test	V8302	Stereoscopic Motion Apparatus
V7003	The Williams Lantern	V8303	Antirheoscope
V7004	The Thomson Lantern	V8305	Illusion of Motion Apparatus
V7006	Jennings' Test	V8306	Illusion of Motion Apparatus
V7007A	Holmgren Test	V8307	Illusion of Motion Apparatus
V7007B	Holmgren Test	V8308	Illusion of Motion Apparatus
V7007C	Holmgren Test	V8309	Illusion of Motion Apparatus
V7011	Stilling Test	V9001	Projection Tachistoscope
V7012	Ishihara Test	V9002	Pendulum-Dick Tachistoscope
V8001	Hering Falling Beads Apparatus	V9003	Drop Tachistoscope
V8002	Hillebrand Edge Apparatus	V9004	Falling Balls Tachistoscope
V8101	Reflection Stereoscope (Wheatstone)	V9101	Exposure Apparatus
V8102	Reflection Stereoscope (Hering's Haploscope)	V9102	Exposure Apparatus
V8103	Demonstration Reflection Stereoscope	V9103	Reading Tachistoscope
V8104	Refraction Stereoscope, Brewster	V8203	Illusion Card
V8105	Refraction Stereoscope, Removable Partition	V8204	Angle Illusion Card
V8106	Refraction Stereoscope, Auxiliary Prisms		
V8107	Refraction Stereoscope, Variable Prisms		
V8108	Tube Stereoscope (Tropostereoscope)		
V8109	Tube Stereoscope (Amblyscope)		
V8111	Filter Stereoscope		
V8112	Binocular Alternation Stereoscope		
V8113	Projection Stereoscope, Polarizing Type		
V8114	Projection Stereoscope, Filter Type		
V8115	Projection Stereoscope, Synchronized Type		
V8117	Mirror Pseudoscope		
V8118	Mirror Pseudoscope		
V8119	Total Reflection Pseudoscope (Wheatstone-Dove)		

A-1001	Model of Ear	P-3002	Goddard's Form Board.
A-2002	Waggener Sound Wave Slide.	P-3003	Test of Mechanical Intelligence.
A-2003	Wave Apparatus (Ames and Bliss).	P-3004	Packing Blocks Test.
A-2004	Crova's Disk.	P-4001	Vernier Chromoscope.
A-2005	Tuning Fork.	P-3007	Puzzle Board.
A-2006	Tuning Forks.	P-4002	Modified Sanford Chronoscope.
A-2007	Tuning Fork.	P-4003	Marietta Reaction Time Set.
A-2008	Set of Tuning Forks.	P-3005	Mirror Drawing Apparatus.
A-2009	Set of Tuning Forks.	P-3105	Pintner-Paterson Performance Test.
A-2010	Set of Tuning Forks.	P-3106	Test of Mechanical Ability.
A-2011	Tuning Fork Weights.	P-3107	Puzzle Board.
A-2012	Disk Siren.	P-3208	Multiple Choice Apparatus.
A-2013	Disk Siren.	P-3209	Multiple Choice Apparatus.
A-2014	Disk Siren.	P-3010	Minnesota Test of Mechanical Ability.
A-2015	Disk Siren.	P-4004	Marietta Chronoscope.
A-2016	Air Jet Attachment.	P-4005	The New Marietta Chronoscope.
A-2017	Organ Pipe.	P-4006	Interval Apparatus.
A-2018	Organ Pipe.	P-3011	Automatograph.
A-2019	Organ Pipes.	P-3012	Steadiness Test.
A-2020	Organ Pipes.	P-3013	Tapping Test.
A-2021	Organ Pipe.	P-3014	Precision Board.
A-2022	Pitch Pipe.	P-3015	Steadiness Test.
A-2023	Quincke's Tubes.	P-3016	Tremograph.
A-2024	Resonance Tubes.	P-3017	Galton Bar.
A-2025	Resonators.	P-3018	Vertical Test.
A-2026	Interference Tubes.	P-3019	Angle Test.
A-2027	Acoustic Chart.	P-3020	Two-hand Coordination Pursuit Meter.
A-2028	Sonometer.	P-3101	Legs Steadiness Test.
A-2029	Sonometer.	P-3102	Back and Legs Ergograph.
A-3001	Galton Whistle.	P-3021	Two Hand Coordination Test.
A-3002	Galton Whistle.	P-3022	Vertical Radius Test.
A-3101	Simple Acoumeter.	P-2023	Horizontal Bisecting Test.
A-3102	Discrimination Acoumeter.	P-4007	Roemer Sound Key.
A-3201	Sound Hammer.	P-4008	Catell Sound Key.
A-3301	Audiometer.	P-4009	Five Finger Key.
A-3302	Audiometer.	P-4010	Müller-Pilzecker Lip Key.
A-3303	Audiometer.	P-4011	Telegraph Sounder.
A-3304	Audiometer.	P-4012	Telegraph Key.
A-4001	Sound Cage.	P-5001	Attention Apparatus.
A-4002	Sound Cage.	P-5002	Epicycloid Pursuitmeter.
A-4003	Tonal Apparatus for Phase Control.	P-5003	Drip Timing Device.
C-1001	Olfactometer.	P-6001	Psychogalvanic Response Apparatus.
C-1002	Olfactometer.	P-6002	Knee Jerk Apparatus.
C-1003	Smell Solutions.	P-6003	Wink Reflex Apparatus.
S-1001	Rubber Stamp.	P-6004	Plethysmograph.
S-1101	Algesiometer.	P-6005	Pneumograph (Berth).
S-1201	Temperature Cylinders.	P-6006	Cardiograph (Jacquet).
S-1202	Heat Grill.	P-6007	Sphygomograph (Lehmann).
S-1301	Electromagnetic Aesthesiometer.	P-6008	Sphygomograph.
S-1302	Von Frey's Threshold Scale.	P-6009	Pneumograph (Marey).
S-1303	Hair Aesthesiometer.	P-6010	Pneumograph (Gutzmann).
S-1304	Two Point Aesthesiometer.	P-6011	Pneumograph.
S-1305	Spearman's Aesthesiometer.	P-6012	Electric Pneumograph (Cason).
S-1306	Tactual Perception Board.	P-7001	Wet Spirometer.
S-1401	Elbow Movement Board.	P-7002	Hand Dynanometer.
S-1402	Discrimination Weights	P-7003	Back & Leg Dynanometer.
S-1411	Size Weight Illusion.	P-7005	Dry Spirometer.
S-1403	Temporal Finger Maze.	P-7006	Wet Spirometer.
P-1001	Instructions Box.	P-7007	Stroke Test.
P-2001	Complication Pendulum.		
P-2002	Complication Clock.		
P-3001	Mirror Drawing Apparatus.		
P-3011	Freeman's Puzzle Box.		

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V-3006 Absorption Band Plates	V-1302 Color Disks, Cardboard
A-3102 Acoumeter, Discrimination	V-1303 Color Disks, Celluloid
A-3101 Acoumeter, Simple	V-1301 Color Disks, Paper
A-2027 Acoustic Chart	V-3204 Color Mixer, Binocular Red and Green
V-2021 Acuity Charts	V-3201 Color Mixing Box, Lambert's
A-2016 Air Jet Attachment	V-3203 Color Mixing Cards for Stereoscope, Binocular
V-2022 Astigmatic Charts	V-3202 Color Shadow Box, Conventional
V-3305 After Image Apparatus	V-1305 Colored Yarns
S-1304 Aesthesiometer, Two point	Q-6202 Commutators
S-1301 Aesthesiometer, Electro- magnetic	P-2002 Complication Clock
S-1303 Aesthesiometer, Hair	P-2001 Complication Pendulum
S-1305 Aesthesiometer, Spear- man's	V-3307 Contrast Box, Hering's
S-1101 Algesiometer	P-8006 Cranial Calipers
Q-5101 Ammeters and voltmeters	P-8005 Craniometer
P-8001 Anthropometric Scale	Q-4101 Counters
P-8002 Anthropometric Scale	Q-4002 Counter, Electric
V-8303 Antirheoscope	Q-4003 " "
P-5001 Attention Apparatus	Q-4001 Counter, Three Unit Electromagnetic
A-3301 Audiometer	A-2004 Crova's Disk
A-3302 " "	
A-3303 " "	
A-3304 " "	
P-3011 Automatograph	S-1402 Discrimination Weights
	V-1215 Dye, "Subjective Yellow"
V-3306 Bonham Disk	P-7003 Dynamometer, Back and Leg
V-2017 Bezold Figure Card	P-7002 Dynamometer, Hand
V-1311 Black Box	
V-2007 Blind Spot Cards	A-1001 Ear, Model of
V-1315 Brightness Scale	V-8002 Edge Apparatus, Hillebrand
	S-1401 Elbow Movement Board
V-5002 Campimeter, Carr's	Q-5001 Electric Motor
V-5001 Campimeter, Peter's Hand	P-3102 Ergograph, Back and Leg
P-6006 Cardiograph, (Jacquet)	V-9101 Exposure Apparatus
V-1306 Celluloid Sheets, Black	V-9102 " "
V-1307 Celluloid Sheets, White	V-2001 Eye, Anatomical Model of
V-2019 Checker Board, Helmholtz	V-2002 Eye, Charts of
V-2016 Chromatic Aberration Apparatus	V-2006 Eye, Kuehne Model
P-4004 Chronoscope, Marietta	V-2010 Eye Movement Mirror
P-4005 Chronoscope, The New Marietta	V-2005 Eye, Skioscopic
P-4002 Chronoscope, Modified Sanford	V-8001 Falling Beads Apparatus, Hering
P-4001 Chronoscope, Vernier	V-1211 Filters, Mazda to Daylight
V-6006 Color Analyzer, Marietta	V-1203 Filters, Monochromatic
V-6002 Colorimeter, Dichromatic	V-1204 " "
V-6001 Colorimeter, Monochromatic	V-1201 Filters, Neutral Tint
V-6003 Colorimeter, Trichromatic, Additive Type	V-1214 Filters, Set of Dichroic
V-6004 Colorimeter, Trichromatic, Subtractive Type	V-1208 Filters, Red, Green & Blue
	V-1212 Filters, Stereo Red & Green
	P-3002 Form Board, Goddard's
	P-3017 Galton Bar

A-3001 Galton Whistle
 A-3002 " "
 Q-6110 Galvanometer
 V-1210 Gelatine, Colored
 P-8004 Goniometer, Facial
 V-3010 Gratings, Double Replica
 Crossed

S-1202 Heat Grill
 V-3101 H. B. & S. Demonstrator.

V-8202 Illusion Board, Arrow Head
 V-8201 Illusion Cards.
 V-8203 " "
 V-8204 Illusion Card, Angle
 V-8305 Illusion of Motion Apparatus
 V-8306 " " "
 V-8307 " " "
 V-8308 " " "
 V-8309 " " "

S-1411 Illusion, Size Weight
 P-1001 Instructions Box
 A-2026 Interference Tubes
 P-4006 Interval Apparatus
 V-2018 Irradiation Card.
 V-2020 Isoscope

P-4009 Key, Five Finger
 P-4010 Key, Müller-Pilzecker Lip
 P-4008 Key, Catell Sound.
 P-4007 Key, Roemer Sound
 Q-5111 Key, Short Circuiting
 P-4012 Key, Telegraph
 Q-6203 " "
 P-6002 Knee Jerk Apparatus
 Q-1001 Kymographs
 Q-1101 Kymograph Smoker

V-1002 Lamp, Carbon Arc
 V-1003 Lamp, Neon
 V-1001 Lamp, Standard
 V-7004 Lantern, The Thomson
 V-7003 Lantern, The Williams
 V-2026 Lenses, Cylinders and Prisms

Q-3003 Marker, Electromagnetic
 Q-3102 Marker, Jointed Tambour
 Q-3305 Marker, Seconds
 Q-3004 Marker, Triple Electro-
 magnetic
 Q-3002 Marker, Tunable
 V-1309 Magnesium Block
 V-1310 Magnesium Ribbon
 V-3402 Masson Disk, Simple
 S-1403 Maze, Temporal Finger
 V-4010 Meter, Foot Candle
 Q-2001 Metronome
 Q-2002 Metronome, Electric Contacts
 P-3208 Multiple Choice Apparatus

P-3209 Multiple Choice Apparatus
 P-3001 Mirror Drawing Apparatus
 P-3005 " " "

V-3304 Negative After Image Cards

C1001 Olfactometer
 C-1002 "

V-4001 Optical Bench

V-1101 Optical Disk

A-2017 Organ Pipes

A-2018 " "

A-2019 " "

A-2020 " "

A-2021 " "

V-2031 Ophthalmometer

V-2030 Ophthalmoscope, Electric

V-2029 Ophthalmoscope, Loring

V-2009 Ophthalmotrope, Knapp's

V-5010 Perimeter, Marietta

V-5008 Perimeter, McHardy

V-5009 Perimeter, McHardy
 Electric

V-5007 Perimeter, Registering

V-5003 Perimeter, Schweigger

V-5006 Perimeter Charts

V-2012 Phacoscope

V-4017 Photochromatic Interval
 Apparatus

Q-6205 Photoelectric Cell

V-4002 Photometer Box
 Lummer-Brodhun

V-4003 Photometer, Bunsen

V-4011 Photometer, Flicker

V-4004 Photometer, Polarizing

A-2022 Pitch Pipe

P-6004 Plethysmograph

P-7004 Pneumo-dynamometer

P-6011 Pneumograph

P-6005 Pneumograph (Berth)

P-6012 Pneumograph, Electric
 (Cason)

P-6010 Pneumograph (Gutzmann)

P-6009 Pneumograph (Marey)

P-3014 Precision Board

V-8120 Pseudoscope, Lenticular

V-8117 Pseudoscope, Mirror

V-8113 " "

V-8119 Pseudoscope, Total
 Reflection, (Wheatstone-
 Dove)

P-6001 Psychogalvanic Response
 Apparatus

P-5002 Pursuitemeter, Epicycloid

P-3020 Pursuitemeter, Two-hand
 Coordination

P-3007 Puzzle Board

P-3107 " "

P-3011 Puzzle Box, Freeman's
 A-2023 Quincke's Tubes
 P-4003 Reaction Time Set,
 Marietta
 Q-6111 Resistance Box
 A-2024 Resonance Tubes
 A-2025 Resonators
 V-2028 Retinoscope, Electric
 V-2027 Retinoscope, Simple
 Q-6201 Rheostats
 Q-6113 Rheostat, Wheatstone Bridge
 V-3209 Rotator, Differential, Diel
 V-3208 Rotator, Differential,
 Marietta Type
 V-3206 Rotator, Maxwell Disk
 V-3207 " " "
 S-1001 Rubber Stamp

 V-4009 Sector Disk, (Rotating
 Rhomboid Prisms)
 V-3301 Simultaneous Induction
 Cards
 V-3303 Simultaneous Induction
 Cards
 A-2012 Siren, Disk
 A-2013 " "
 A-2014 " "
 A-2015 " "
 C-1003 Smell Solutions
 A-2023 Sonometer
 A-2029 "
 A-4001 Sound Cage
 A-4002 " "
 P-4011 Sounder, Telegraph
 Q-6204 " "
 A-3201 Sound Hammer
 A-2002 Sound Wave Slide, Waggener
 V-4013 Spectrometer
 V-4014 "
 V-4015 Spectrophotometer, Standard
 V-6005 " " "
 V-3005 Spectroscope, Replica
 Grating
 V-3001 Spectroscope
 V-3003 "
 V-3004 "
 V-1004 Spectrum Tubes
 V-1005 " "
 P-7005 Spirometer, Dry
 P-7001 Spirometer, Wet
 P-7006 " "
 P-6008 Sphygmograph
 P-6007 Sphygmograph (Lehman)
 P-8003 Stadiometer
 V-8112 Stereoscope, Binocular
 Alternation
 V-8104 Stereoscope, Brewster
 Refraction

 V-8103 Stereoscope, Demonstration
 Reflection
 V-8111 Stereoscope, Filter
 V-8114 Stereoscope, Projection
 Filter Type
 V-8113 Stereoscope, Projection
 Polarizing Type
 V-8115 Stereoscope, Projection
 Synchronized Type
 V-8102 Stereoscope, Reflection
 (Hering's Haploscope)
 V-8101 Stereoscope, Reflection
 (Wheatstone)
 V-8105 Stereoscope, Refraction
 Removable Partition
 V-8106 Stereoscope, Refraction
 Auxiliary Prisms
 V-8107 Stereoscope, Refraction,
 Variable Prisms
 V-8109 Stereoscope, Tube.
 (Amblyscope)
 V-8108 Stereoscope, Tube
 (Tropostereoscope)
 V-8121 Stereoscopic Cards
 V-8302 Stereoscopic Motion
 Apparatus
 Q-2003 Stop Clock
 Q-2103 Stop Watch
 Q-2105 " "
 Q-2106 " "
 Q-2108 Stop Watch, 1/50 and
 1/100 second
 Q-2107 Stop Watch, 1/100
 second
 Q-2104 Stop Watch, Pastor
 Q-5122 Switches, Knife
 Q-6208 Switch, Mercury

 V-9003 Tachistoscope, Drop
 V-9004 Tachistoscope, Falling Balls
 V-9002 Tachistoscope, Pendulum
 Disk
 V-9001 Tachistoscope, Projection
 V-9103 Tachistoscope, Reading
 Q-4012 Tachometer, Stop Watch
 S-1306 Tactual Perception Board
 S-1201 Temperature Cylinders
 P-3019 Test, Angle
 V-7001 Test, Donder's
 V-7002 Test, Ishihara
 V-7006 Test, Jennings
 V-2023 Test, Heterophoria
 V-7007A Test, Holmgren
 V-7007B " "
 V-7007C " "
 P-2023 Test, Horizontal Bisecting
 P-3101 Test, Legs Steadiness
 P-3106 Test of Mechanical Ability
 P-3010 Test of Mechanical Ability
 Minnesota

P-3003 Test of Mechanical Intelligence
 P-3004 Test, Packing Blocks
 P-3105 Test, Pintner-Paterson Performance
 V-7002 Test, Scripture's
 P-3012 Test, Steadiness
 P-3015 " "
 V-7011 Test, Stilling
 P-7007 Test, Stroke
 P-3013 Test, Tapping
 P-3021 Test, Two-hand Coordination
 P-3018 Test, Vertical
 P-3022 Test, Vertical Radius
 V-3401 Threshold Disks
 S-1302 Threshold Scale, Von Frey's.
 P-5003 Timing Device, Drip
 Q-6206 Transformers, Step Down
 Q-6207 Transformers, Step Up
 P-3016 Tremograph
 V-2024 Trial Frame
 V-2025 " "
 Q-9001 Tripod Bases
 A-4003 Tonal Apparatus for Phase Control
 A-2005 Tuning Forks
 A-2006 " "
 A-2007 " "
 A-2008 Tuning Forks, Set of
 A-2009 " " " "
 A-2010 " " " "
 Q-2101 Tuning Fork, 50 DV.
 Electrically Maintained
 Q-2102 Tuning Fork, 100 DV.
 Electrically Maintained
 A-2011 Tuning Fork Weights

 Q-5101 Voltmeters and Ammeters

 A-2003 Wave Apparatus (Ames and Bliss)
 V-1202 Wedges, Neutral Tint
 P-6003 Wink Reflex Apparatus
 V-2011 " " " "

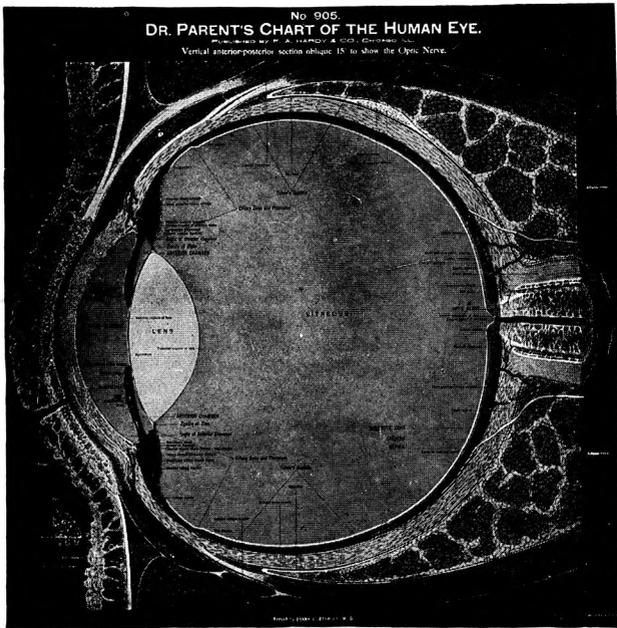


Fig. 1

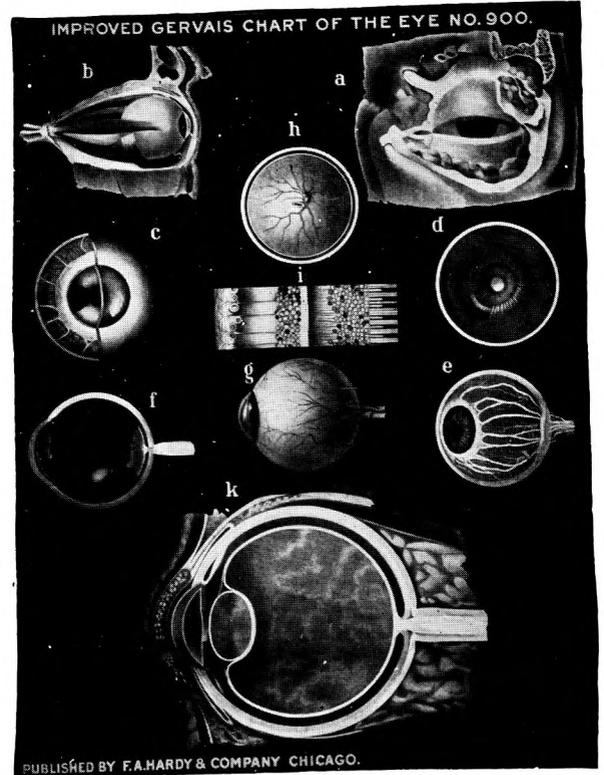


Fig. 4

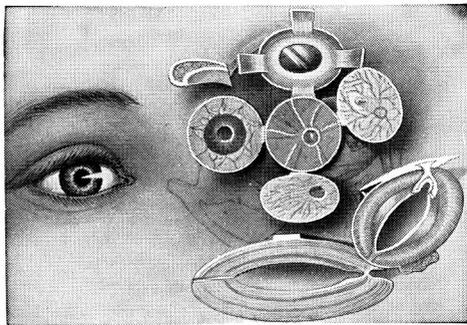


Fig. 2

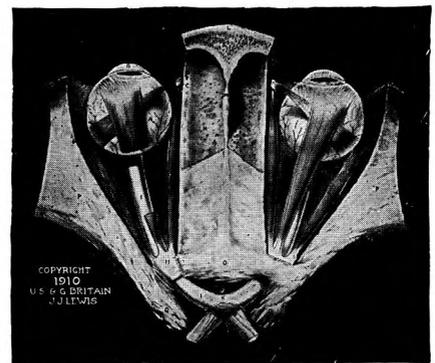


Fig. 5

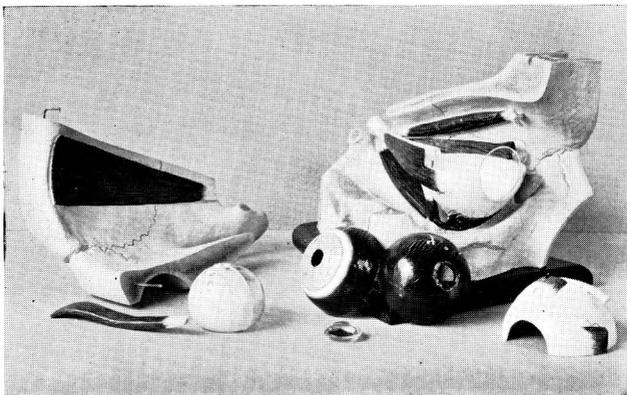


Fig. 3

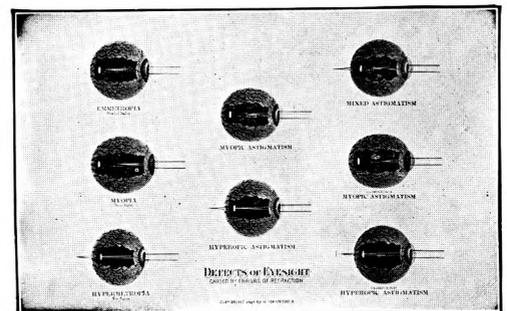


Fig. 6

V1001 Standard Lamp. Tungsten filament. Supplied in either 25 or 50 watts; accompanied by certificate of candle power and voltage. Accompanied also by table of typical tungsten lamp spectral energy distributions, with comparison of daylight distribution values - - \$ 15.00

V1002 Carbon Arc Lamp. Carbons at right angles, mounted in sheet iron case, with condensing lens which provides converging, parallel, or diverging beam. Mounted on tripod stand with swivel clamp. Provides an approximate point source of considerably intensity. Has rheostat, connecting cord, and six pairs of carbons. - - - - \$ 25.00.

V1003 Neon Lamps for 110 volts, A.C. These are small lamps with standard Edison base, suitable for stroboscopic uses, on 60 cycle current. \$ 1.00

V1004 Spectrum Tubes. Any size or shape, any gas, including mercury vapor, in amber glass providing green lines only. Complete with transformer of suitable voltage. Tubing per foot, \$2.00, minimum \$5.00 per tube. Transformers, any size, \$1.00 per thousand volts, minimum size - \$ 3.00.

V1005 Spectrum Tubes. Standard types. - each - - \$ 3.00
Optical Disk.

V1101 This instrument consists of a metal dial 30 cm. in diameter, silver satin finish with etched graduations. Supports for use in vertical or horizontal position. The outfit includes one each of the following: Spherical lens, hemispherical lens, double convex lens, double concave lens, 90° triangular prism, 45° and 90° trapezoidal prism, plane mirror, concave mirror, convex mirror and three colored glass screens, Price - - - - \$26.50
Diverging ray attachment for above - - \$10.00
Source of light for parallel rays - - \$16.00.

V1201 Neutral Tint Filters. Made of gelatine containing a mixture of dyes so balanced as to produce practical spectral neutrality. Transmission range: 75%, 50%, 25%, 10%, 5%, 1%, .1%, .01%. Cemented in good quality glass, in 2 inch squares, each - - - \$ 5.00.

V1202 Neutral Tint Wedges. Similar in character to V1201, with wedge ranges as follows:
A--100 to 50%, B--100 to 10%, C--100 to 1%,
D--100 to .1%, E--100 to .01%. Made in three sizes (tinted area)
10 x 1½ cm, 15 x 2 cm, 20 x 3 cm.
Plain wedge: small size - \$8.50; medium - \$11.50; large - \$ 14.50
Provided with balancing wedge - \$11.50; 16.00 \$ 19.50
Calibrated, with " " \$14.50; 19.50 \$ 22.50

V1203 Monochromatic Filters. Set of seven with narrow transmission bands. Cemented in glass plates, 2 inches square -- - \$ 35.00.

V1204 Monochromatic Filters, Glass. Special set for use with mercury light. Approximate transmissions:

Filter	A	690	31%	Percent Transmitted
	B	623	8%	" "
	C	578	2%	
	D	546	14%	
	E	491	5%	
	F	435	22%	(also some 690)
	G	404	4%	
	H	365	31%	

In 2" squares: polished, each \$5.00 - per set \$ 35.00.
unpolished, " \$2.50 - per set \$ 17.50.

(Other sizes, and other transmissions, prices on request.)

V1208	Red, green, and blue filters. Cemented in good white glass, 2" square, Per set	-	-	-	\$ 11.00.
V1210	Colored Gelatine. Sheets 10 inches square, set of 20, without specified transmissions, Set of small samples sent free on request	-	-	-	\$ 5.00.
V1211	Special Filter, mazda to daylight, 2" square.	-			\$ 3.25
V1212	Special Filters, "stereo" red and blue-green, 2" square	-			\$ 5.25
V1214	Set of Dichroic Filters. Useful in demonstrating the shift in "dominant wave length" or hue value due to variations in thickness of absorbing medium.	-	-		\$ 10.00.
V1215	"Subjective Yellow" Dye. This provides a striking illustration of a "yellow" substance which is free from "yellow" spectral trans- mission, having transmission only in the red and the green region.				\$ 5.00.
V1301	Color Disks- Paper. Diameter: large $7\frac{3}{4}$ ", small $5\frac{1}{2}$ ". Hole $\frac{1}{2}$ " diameter. <u>Set A:</u> (44 disks) consists of one large and one small of each of the following (22) colors: red, red orange, orange red, orange, yellow orange, orange yellow, yellow, green yellow, yellow green, green, blue green, green blue, blue, purple blue, blue purple, purple, red purple, purple red, black, white, two grays.	-	-	-	\$ 2.25
	<u>Set B:</u> (16 disks) consists of one large and one small of each of the following (8) colors: red, orange, yellow, green, blue, purple, black and white.	-	-		\$ 1.25
	<u>Single colors</u> , any size, per dozen	-	-		\$ 1.00
V1302	Color Disks - Cardboard. Set of 40 disks, consisting of one large and one small of each of the same colors as in II-1-34 Set A, except grays.	-	-		\$ 4.50
	<u>Single colors</u> : any size, per dozen	-	-		\$ 2.00
V1303	Color Disks- Celluloid. Set of 12 disks, consisting of one large and one small of each of the following: red, yellow, green, blue, black and white.	-	-		\$ 3.50
	<u>Single Colors</u> , any size, per dozen	-	-		\$ 3.75
V1305	Colored Yarns, set of 90 skeins of wool.	-			\$15.00
V1306	Black Celluloid Sheets (opaque) #10 thickness, 10x12 in.				\$.50
					.75
					1.25
					2.25
V1307	White Celluloid Sheets (opaque) #10 thickness (Same prices as V1306)				
V1309	Magnesium Carbonate Block				\$.25
V1310	Magnesium Ribbon				\$ 1.00
V1311	Black Box, Velvet Lined, 10"x10"x4', with changeable slit front	-	-		\$ 15.00

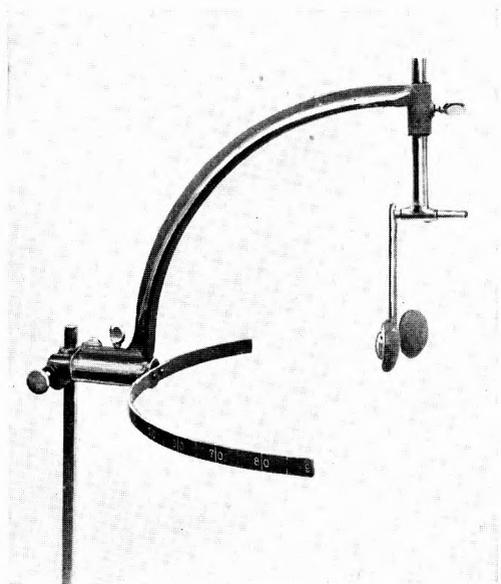


Fig. 7

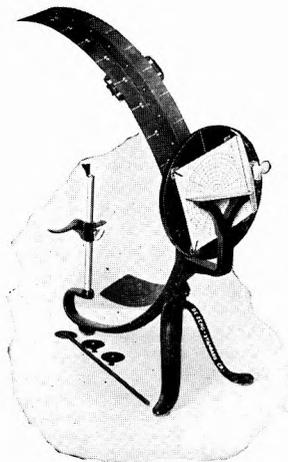


Fig. 10

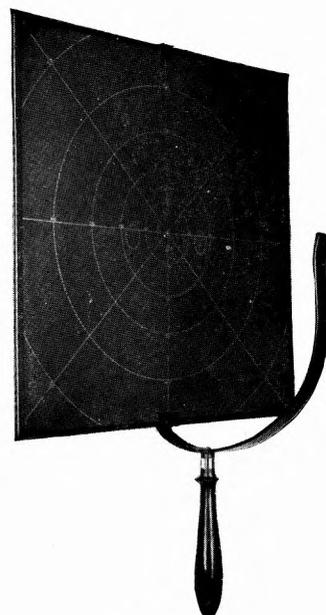


Fig. 11

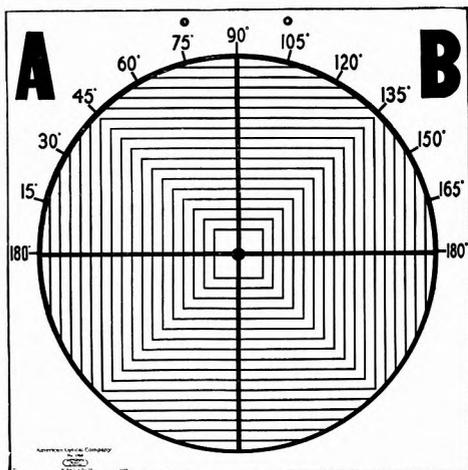


Fig. 8



Fig. 12

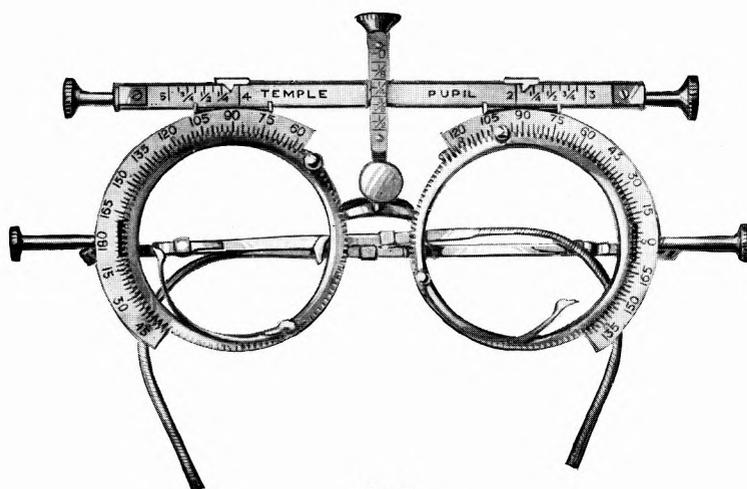


Fig. 9

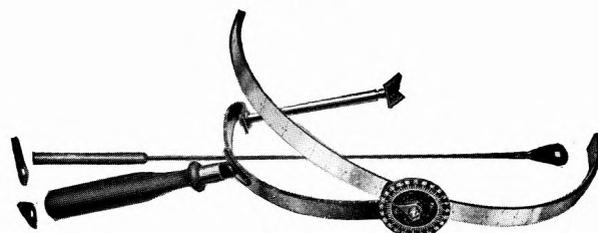


Fig. 13

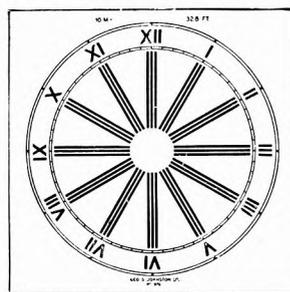


Fig. 14

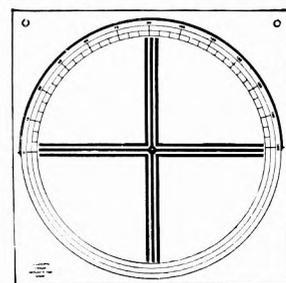


Fig. 15

V1315	Brightness Scale. Thirty shades on celluloid sheets 15 cm. square. Per set	-	-	-	\$ 7.50.
V2001	Anatomical Model of Eye. Fig.3.	-	-	-	\$ 25.00
V2002	Charts of Eye. A (Figure 1)	-	-	-	\$ 5.00
	B (Figure 2)	-	-	-	\$ 4.00
	C (Figure 4)	-	-	-	\$ 5.00
	D (Figure 5)	-	-	-	\$ 3.00
	E (Figure 6)	-	-	-	\$ 3.00
V2005	Skioscopic Eye, with simple retinoscope, and set of Fig. 21 instructions	-	-	-	\$ 15.00
V2006	Kuehne Eye Model. With this instrument the optical construction of the eye, its normal and abnormal condition and the necessary corrections can be demonstrated and studied. The model consists of a tank with glass sides and back, and a cornea at the front, with extra parts as follows: one cylindrical lens for showing astigmatism, two lenses representing the accommodation for near and far objects, six spherical and six cylindrical correcting lenses, set of diaphragms for demonstrating spherical aberration, etc. Complete with fluorescent dye for making the path of the rays visible, and full instructions,	-	-	-	\$ 65.00.
V2007	Blind Spot Cards.	-	-	-	\$ 4.50.
V2009	Knapp's Ophthalmotrope. A simple device for demonstrating Fig.35-1 the action of the external muscles of the eyes. The eyes are mounted on ball-and-socket pivots, and the various muscles are represented by cords running over pulleys to weights.	-	-	-	\$ 45.00.
V2010	Eye Movement Mirror (Freeman)	-	-	-	\$ 12.00.
Fig. 36					
V2011	Wink Reflex Apparatus	-	-	-	\$ 15.00.
V2012	Phacoscope (Sanson's Images Apparatus	-	-	-	\$ 75.00.
V2016	Chromatic aberration apparatus. This equipment consists of two parts. The first is a special type of filter which transmits only the wave lengths at the extreme ends of the spectrum. When viewed through this filter the filament of a Mazda lamp appears to have a violet core surrounded by a red margin. The second part consists of a box containing, side by side, on holders which are adjustable forward and backward, two vertical stenopaic slit disks. These are illuminated from behind by two lamps, the light of which shines through blue and red glasses respectively. These red and blue slits are viewed through a horizontal slit. The effect of chromatic aberration on accommodation is demonstrated by the distance adjustment necessary to produce apparent equality.	-	-	-	\$ 32.00.
V2017	Bezold Figure Card. This card contains a large and a small Fig. 35-8 figure, each consisting of a series of concentric black and white circles. When out of focus, the circles show colored margins, due to chromatic aberration	-	-	-	\$ 1.00.

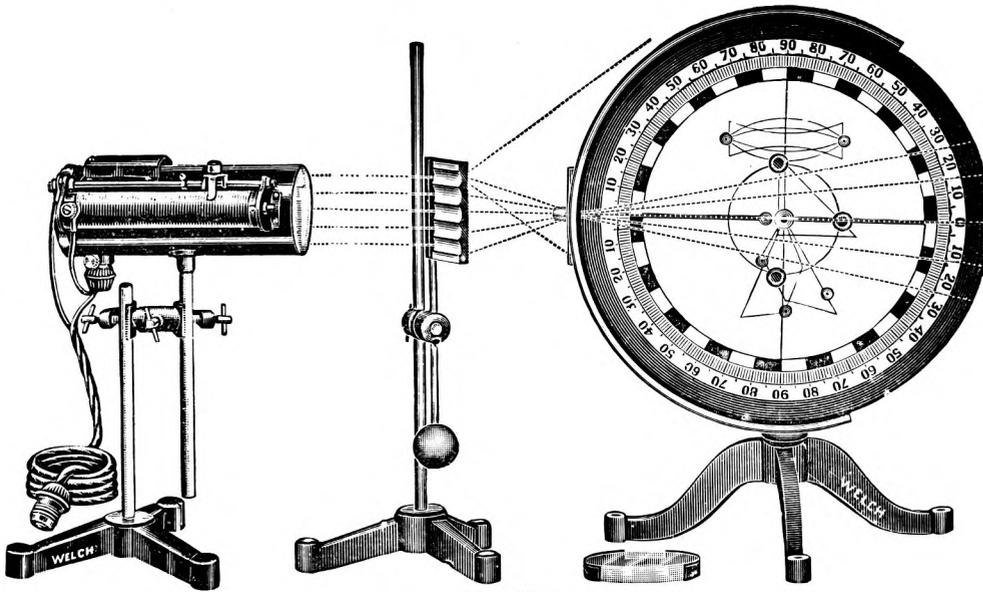


Fig. 16



Fig. 17

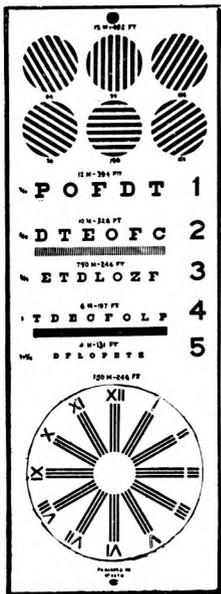


Fig. 18

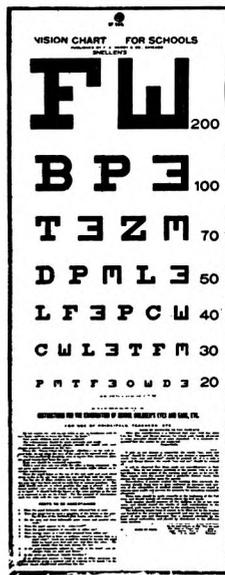


Fig. 19



Fig. 21



Fig. 22

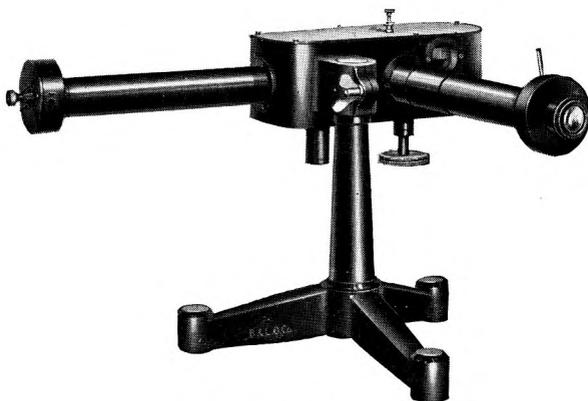


Fig. 20



Fig. 23



Fig. 24

V2018.	Irradiation Card. This card shows a white square containing a smaller black square, and a black square containing a smaller white square. The paired squares are the same size, and appear to be approximately equal in area in low illumination, but under a strong light the contained squares appear quite different in size	-	-	-	-	\$ 1.00
V2019	Helmholtz Checker Board. This figure, though containing no straight lines, appears as a perfect checker board when held close to the eye.	-	-	-	-	\$ 2.00
V2020	Fig. 35-2 Isoscope (Donders). An apparatus for studying the conditions for "Subjective Vertical." If two strings are presented to the left eye and one vertical one to the right eye, and if a person looks at them in such a way that in the binocular image the right string lies between those of the left eye, then the strings, which are in reality parallel, seem in general to be inclined one toward the other. Conversely, the strings of the one eye must be inclined at a definite angle toward the string of the other eye, if all three appear to be parallel. The purpose of the isoscope is to determine the relation of the subjective binocular vertical to the objective vertical and its dependence on convergence, on the inclination of the plane of vision, and on contours which are also in the field of vision, etc.	-	-	-	-	\$ 35.00.
V2021	Acuity Charts	-	-	-	-	\$ 1.00.
Fig. 18						
Fig. 19						
V2022	Astigmatic Charts.	-	-	-	-	\$ 1.00.
Fig. 8	Rotary Type	-	-	-	-	\$ 2.00.
Fig. 14						
Fig. 15						
V2023	Heterophoria Test. This consists of a simple trial frame with red and green disks, and 3 pairs of prisms, $\frac{1}{2}$ D, 1D & 2D.					\$ 12.00.
V2024	Trial Frame. Simple open type, with celluloid scale.					\$ 5.00.
V2025	Trial Frame. Revolving cell, adjustable temple and nose parts.	-	-	-	-	\$ 15.00.
Fig. 9						
V2026	Lenses, Cylinders, and Prisms for use in trial frames V2023, V2024, and V2025,					
	Lenses plus or minus, up to 8.00 D per pair	-	-	-	-	\$ 2.50.
	Cylinders plus or minus, up to 8.00 D per pair	-	-	-	-	\$ 3.50.
	Prisms, up to 8 D per pair	-	-	-	-	\$ 3.00.
V2027	Simple Retinoscope, non-luminous	-	-	-	-	\$ 3.50.
V2028	Electric Retinoscope	-	-	-	-	\$ 26.00.
V2029	Loring Ophthalmoscope, non-luminous	-	-	-	-	\$ 16.00.
V2030	Electric Ophthalmoscope	-	-	-	-	\$ 25.50.
Fig. 17						
V2031	Ophthalmometer	-	-	-	-	\$195.00.

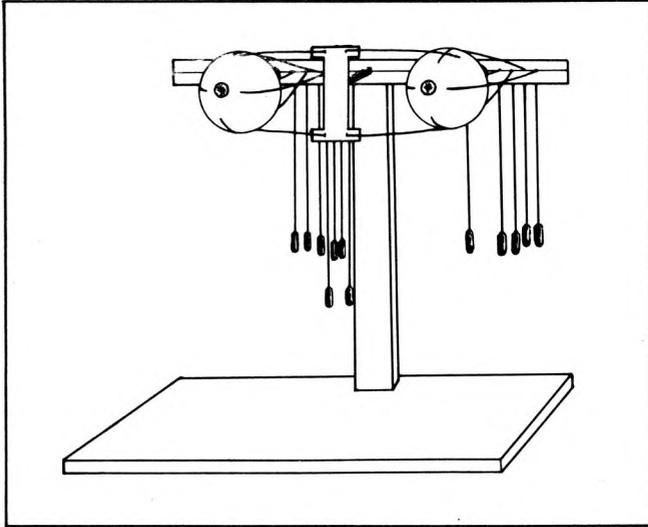


FIG. 35-1

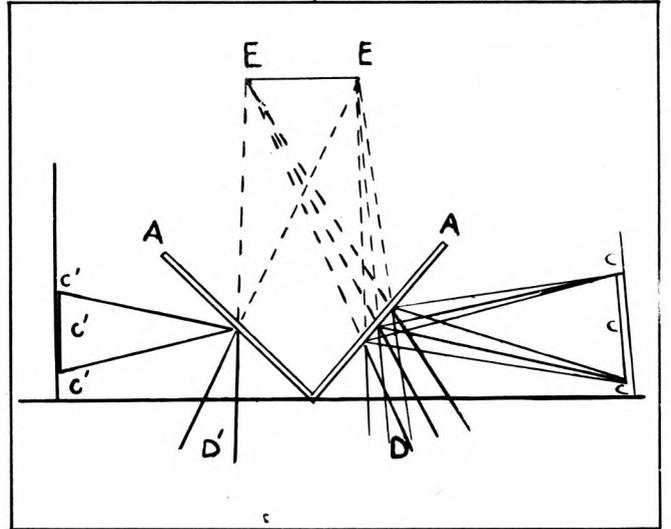


FIG. 35-4

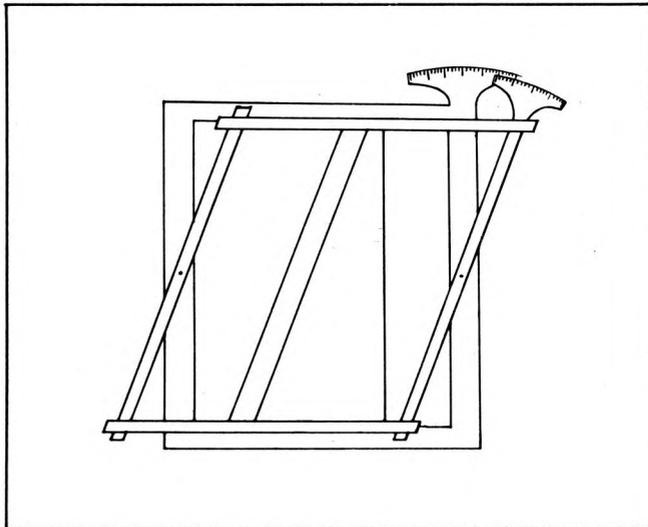


FIG. 35-2

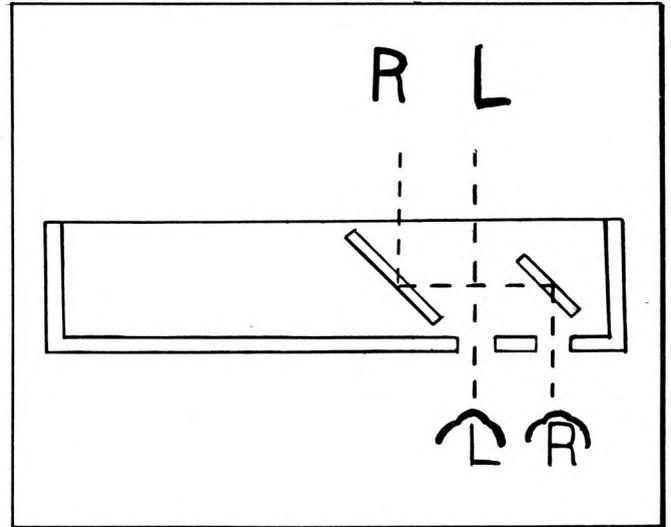


FIG. 35-5

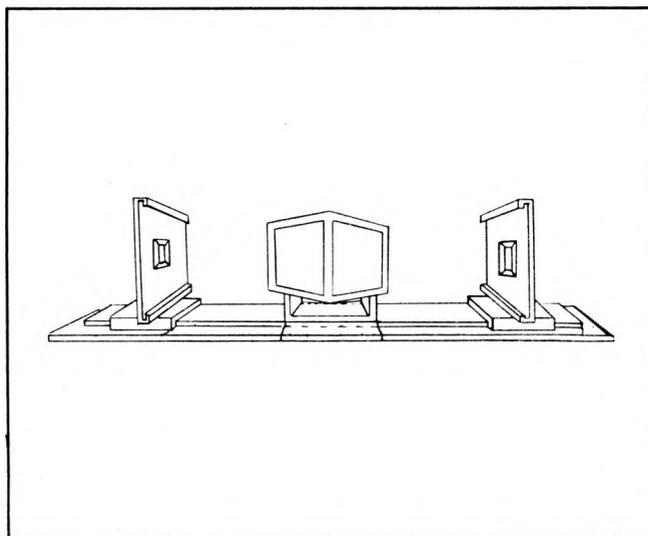


FIG. 35-3

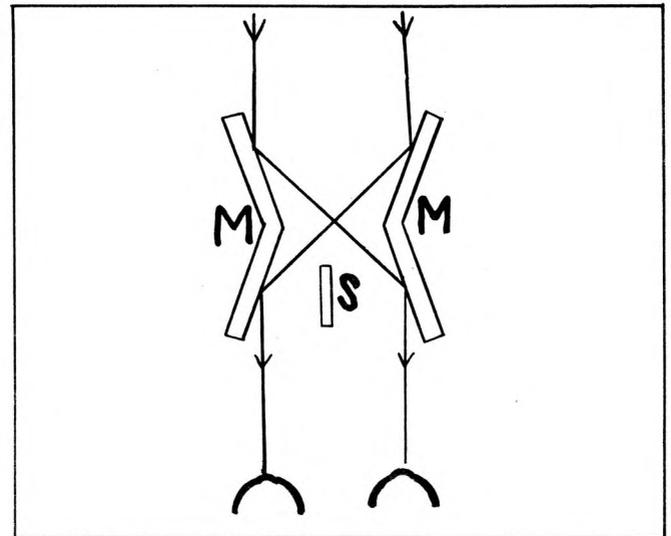


FIG. 35-6

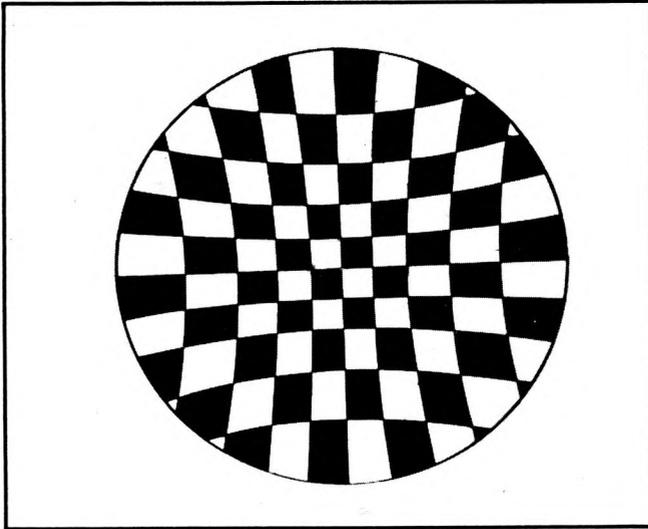


FIG. 35-7

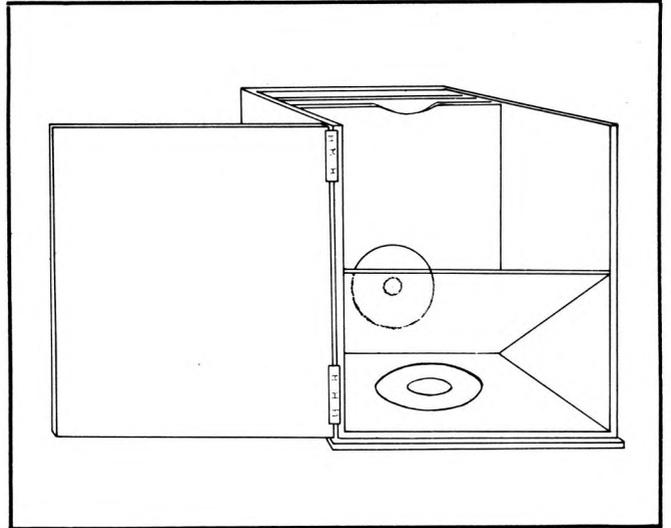


FIG. 35-10

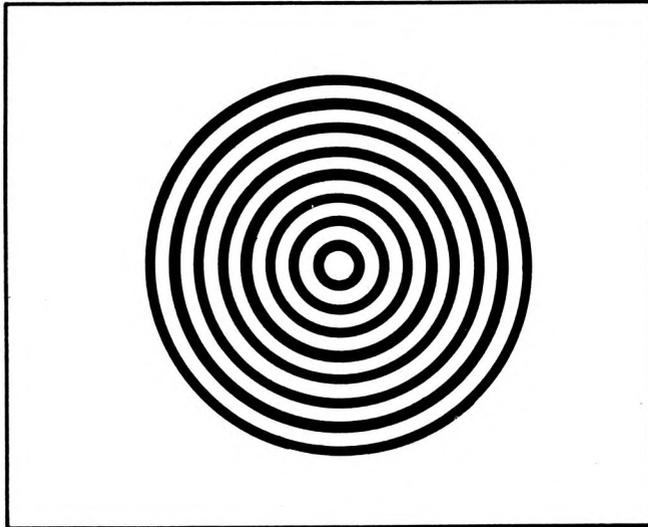


FIG. 35-8

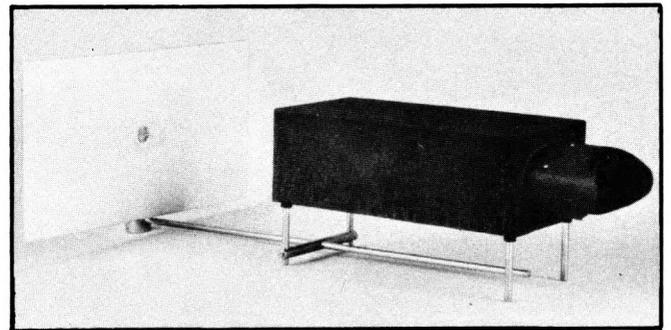


FIG. 35-11

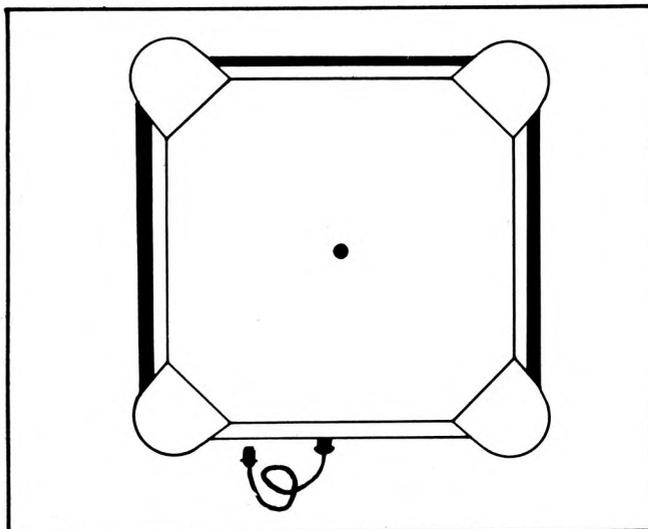


FIG. 35-9

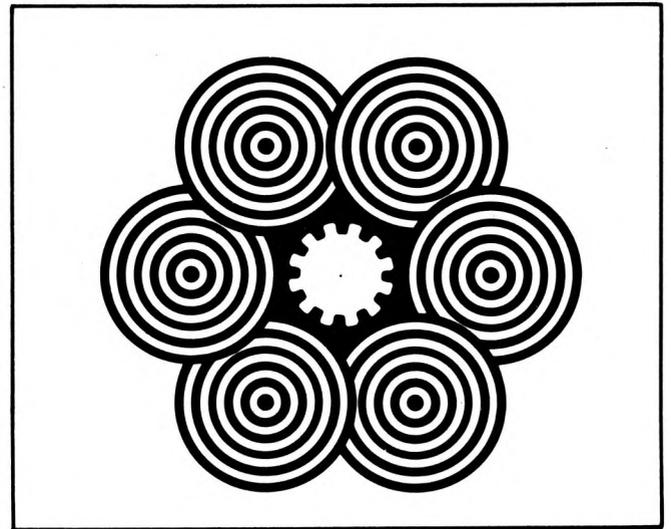


FIG. 35-12

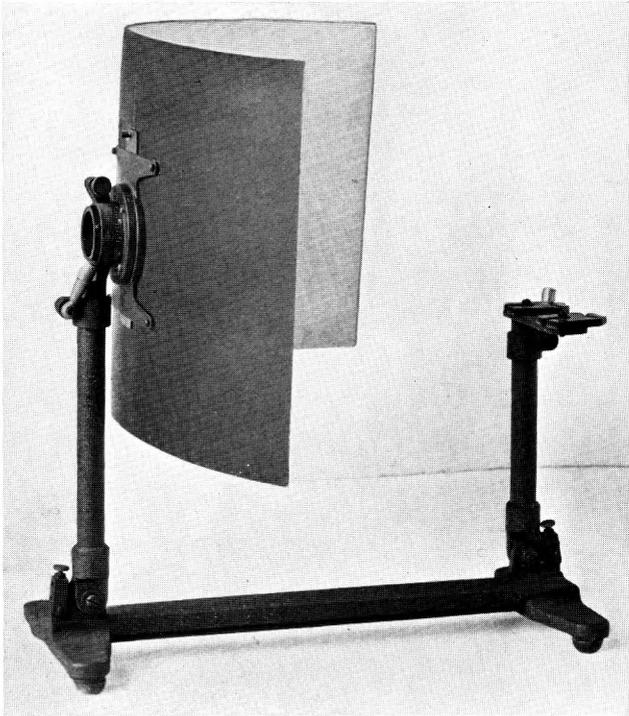


Fig. 25

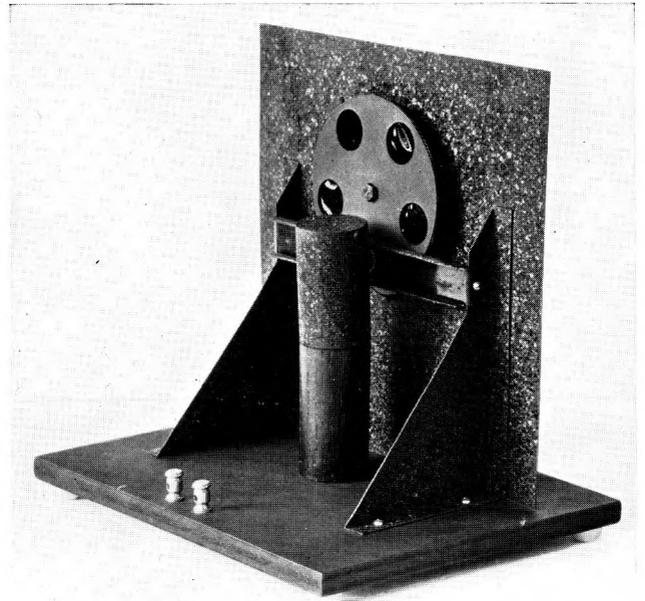


Fig. 27

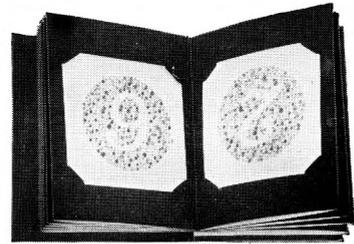


Fig. 28

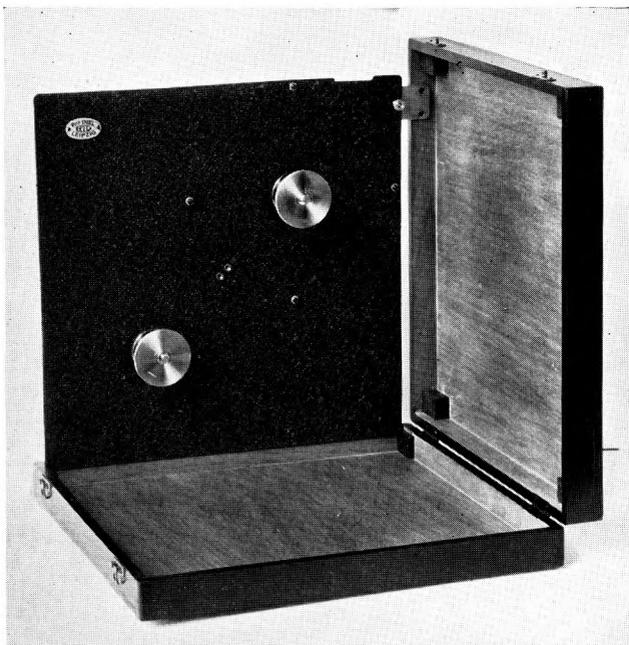


Fig. 26

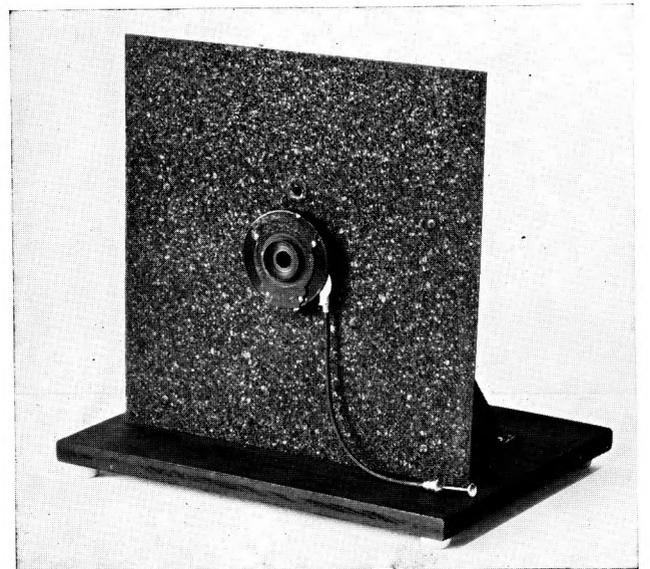


Fig. 29

V3001	Spectroscope, Pocket Size. Three and one-half inches long Fig. 23			\$ 22.50.
V3003	Spectroscope. A compact spectroscope of standard type. It Fig. 20 gives a brilliant spectrum of ample length and sharpness. The collimator and the telescope objectives are of 15 mm. aperture and about 125 mm. focal length. The telescope has focal adjustment and rotation to permit setting on any part of the spectrum. The scale is mounted on a draw tube to permit adjustment to the focus of the telescope.	-		\$ 55.00.
V3004	Spectroscope. This spectroscope is 260 mm. high; the collimator and the telescope objectives are 25 mm. aperature and about 200 mm. focal length. The slit is of adjustable width and 10 mm. in length. The telescope rotates about the axis of the instrument by means of a tangent screw over a sufficient angle to permit ready observation of the entire spectrum. The scale is mounted at the proper angle to secure full reflection from the face of the prism and is so adjusted as to bring the scale image to the proper position.	-	-	\$ 90.00.
	Comparison Prism, fitted to slit	-		\$ 8.50.
	Delicate Focusing Adjustment for Telescope	-		\$ 9.00.
	Electric Lamp for Scale	-		\$ 8.00.
V3005	Replica Grating Spectroscope. This apparatus consists of a light-tight box, with eye piece, adjustable slit and replica grating, wave length scale 18 cm. long, and holder for spectrum tubes, etc. Useful as a simple demonstration type of spectrometer and means of spectroscopic analysis.	-		\$ 50.00.
V3006	Set of 10 absorption band gelatine sheets suitable for use with V3005	-	-	\$ 7.50.
V3010	Double Replica Crossed Gratings for Lantern Projection			\$ 25.00.
V3101	H.B. & S. Demonstrator. A special type of differential rotator, carrying a black sector disk superimposed upon a special 3-zone color disk. The inner zone illustrates changes in hue, the middle zone, changes in brilliance, the outer zone, changes in saturation. The colored disk is 50% exposed and "slips" on the sector disk at the rate of one revolution in 450 . This differential change is automatic, and has the optimum rate for observation of changes. There are 6 color disks in the set, illustrating the following hue combinations: R-Y, Y-G, G-B, B-R, and two pairs of complementaries.			
	Without motor	-	-	\$ 55.00.
	With motor	-	-	\$ 72.00.
V3201	Lambert's Color Mixing Box. This device consists of a light, tight box, with eye piece, a pair of transparent colored plates, a movable light source, and a partition of plate glass. The arrangement provides for fusion of the one color transmitted and the other reflected by the plate glass. The relative intensity of the two components is controlled by the position of the light.			\$ 58.00.
V3202	Conventional Color Shadow Board Fig. 35-9	-	-	\$ 54.00.
V3203	Binocular Color Mixing Cards for Stereoscope. Set of 10			\$ 5.00.

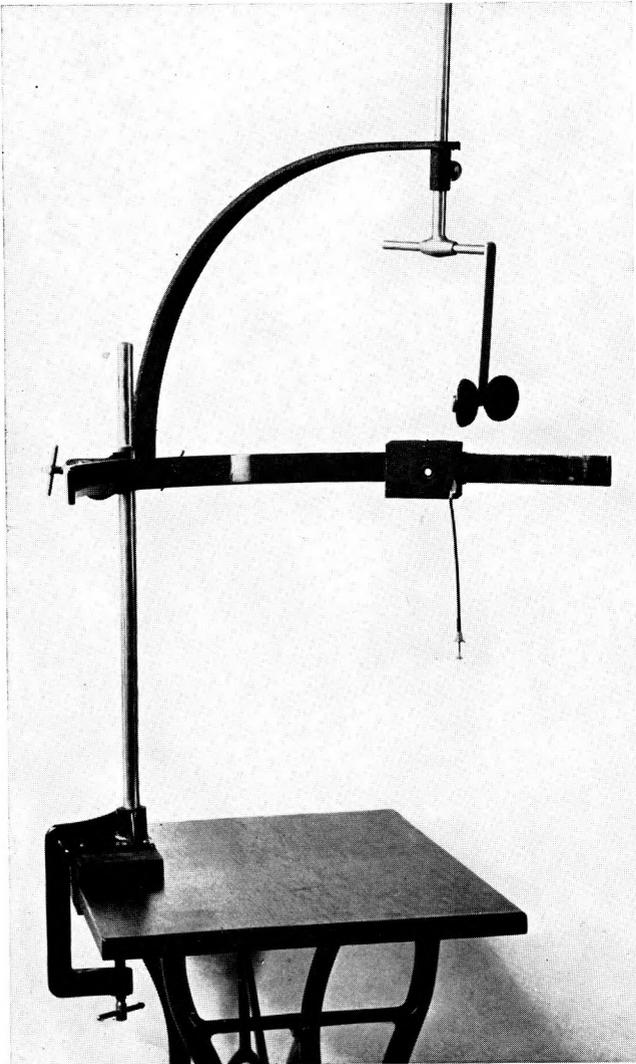


Fig. 30

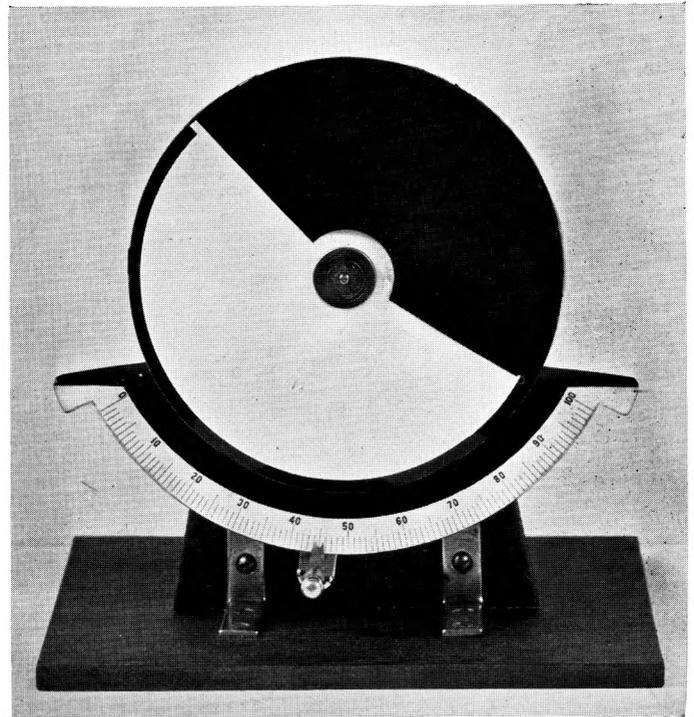


Fig. 32



Fig. 31

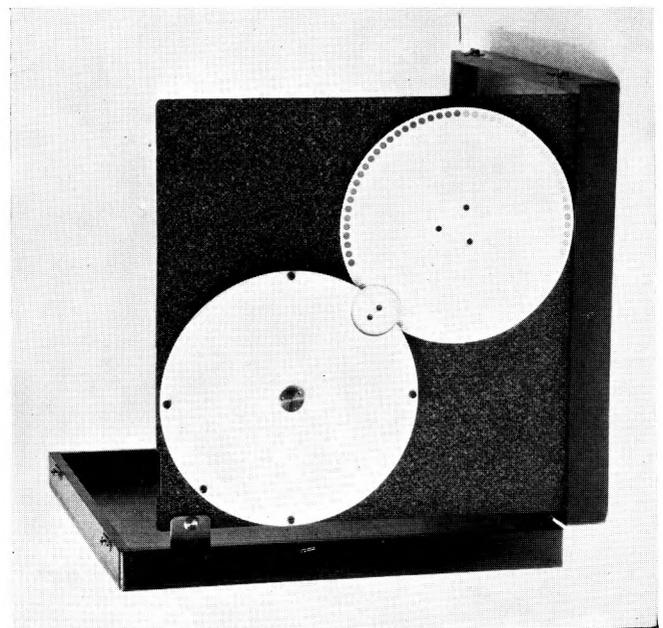


Fig. 33

V3204	Binocular Red and Green Mixer. This device provides an effective means of demonstrating the binocular synthesis of yellow from red and green.	-	-	\$ 35.00.
V3206	Maxwell Disk Rotator Fig.41	-	-	\$ 22.00.
V3207	Maxwell Disk Rotator Fig.152	-	-	\$ 29.00.
V3208	Differential Rotator, Marietta Type - with motor	-	-	\$ 83.00.
V3209	Differential Rotator (Diel)	-	-	\$ 115.00.
V3301	Simultaneous Induction Cards. These cards have a star shaped hole in the centre, through which a gray surface is viewed. By holding the card at an appropriate angle, and at a suitable distance above the gray surface, so that the light illuminating both surfaces provides an approximate equality of brightness, an induction effect is secured. Set of 12, three each of four colors	-	-	\$ 2.50.
V3303	Simultaneous Induction Disks. Pairs of large and small paper disks, with intermediate disks of black and white. The gray zone shows induction effect and illustrates dependence of same on ratio of brightness of gray to that of the inducing color. Set of 6 colors	-	-	\$ 2.00.
V3304	Negative After-Image Cards. Set of 12, three each of four colors	-	-	\$ 3.50.
V3305	After Image Apparatus. This piece of equipment is offered through the courtesy of W.N. Kellog, Columbia University. For discussion see the American Journal of Psychology, January 1929, from which the following brief description is quoted. The cut, (figure 51) is here used through the courtesy of this journal. (Quote page 119.)	-	-	\$ 65.00.

"The rotating disk and its bearings and shaft are set in a square wooden box. The box has a circular opening at the front (H-H) through which the observer (beyond "O" in the figure) sees the disk. Its two compartments are separated by a square piece of 1/8 in. opal glass (G) just behind the rotating disk (I-I). The shaft carrying the disk pierces this glass at the center and is sustained by bearings at A and A' (side view). The pulley (P) behind the box is connected by a belt-drive to a variable speed 120-y motor."

V3401	Threshold Disks. Set on disks of the Masson type, with black on white, white on black, color on black, color on gray. Set of ten disks	-	-	\$ 10.00.
V3402	Simple Masson Disk (Black on White)	-	-	\$ 3.00.
V4001	Optical Bench, high grade double rod type, graduated, with 3 support clamps	-	-	\$ 70.00.
V4002	Lummer-Brodhun Photometer Box	-	-	\$ 95.00.
V4003	Bunsen Photometer (Enclosed type)	-	-	\$ 25.00.
V3306	Benham Disk	-	-	\$ 1.00.
V4004	Polarizing Photometer	-	-	\$ 205.00.
V3307	Hering's Contrast Box	-	-	\$ 45.00.
Fig.35-10				

V4009	Sector Disk, Lummer-Brodhun Rotating Rhomboid Prisms			\$ 165.00.
V4010	Foot Candle Meter. An instrument by which the foot candles of illumination on any surface may be determined by direct observation. It operates on the same principle as the Bunsen photometer, the substitute for the oil spot being a row of small discs of translucent paper. One end of this row is next to a small incandescent lamp mounted inside the box and the discs are noticeably illuminated from the inside up to a certain point, depending on how much outside illumination is falling upon the discs at the particular location of the meter. The point of disappearance of the inside illumination, found on a scale graduated in foot candles which is placed alongside of the row of discs, gives the amount of illumination for that location. The case also contains a battery rheostat and a small volt meter for standardizing the illumination of the inside lamp. Mounted in a hardwood-metal box 20 x 25 c.m., -			\$ 35.00.
V4011	Flicker Photometer	-	-	\$ 225.00.
V4013	Spectrometer, Spencer Student Model Fig. 22.	-	-	\$ 135.00.
V4014	Spectrometer, Gaertner Model	-	-	\$ 525.00.
V4015	Standard Spectrophotometer	-	-	\$ 635.00.
V4017	Photochromatic Interval Apparatus Fig. 27 & 29	-	-	\$ 55.00.
V5001	Peter's Hand Campimeter Fig. 11	-	-	\$ 22.00.
V5002	Carr's Campimeter, including Rotator Fig.25	-	-	\$ 95.00.
V5003	Schweigger Perimeter Fig.13	-	-	\$ 25.00.
V5006	Perimeter Charts per 100 (50 Right, 50 Left)	-	-	\$ 2.00.
V5007	Registering Perimeter. In this perimeter the chart moves with the arc. Has adjustable chin rest.	-	-	\$ 49.00.
	Can be supplied with color apertures 1,3,5,10 & 15 mm.			\$ 57.00.
V5008	McHardy Perimeter. This perimeter is self-registering. Fig.12 Supplied with color carrier having 1,3,5,10, and 15 mm. apertures.	-	-	\$ 160.00.
V5009	McHardy Electric Perimeter. This model combines the daylight equipment, as in V5008 with special translucent color equipment for use in dark room.	-	-	\$ 250.00.
V5010	Marietta Perimeter. The chief characteristic of this piece of equipment is the unit for controlling the spot of color. In the simple perimeter in common use the brightness of the color spot undergoes frequent changes on account of varying relations to the source of light. The design here presented uses a small box containing lamp and set of color filters in place of the usual disk and reflected light. Constant brightness is thus maintained. The			

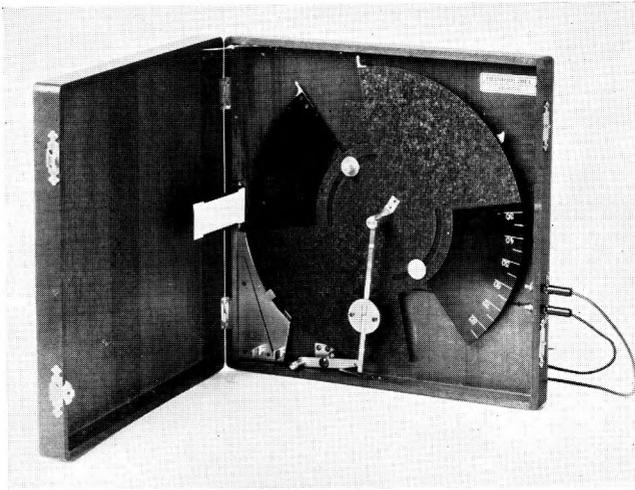


Fig. 34

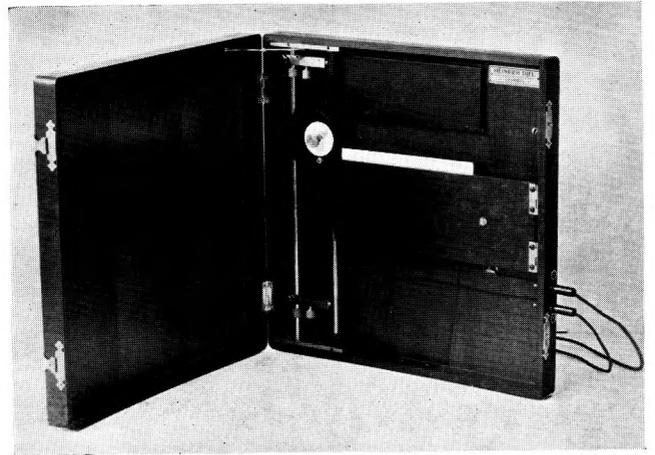


Fig. 37

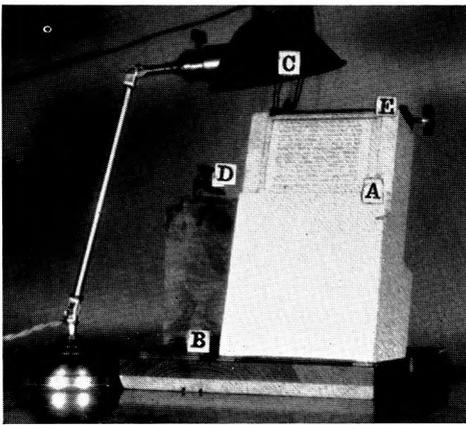


Fig. 35



Fig. 38

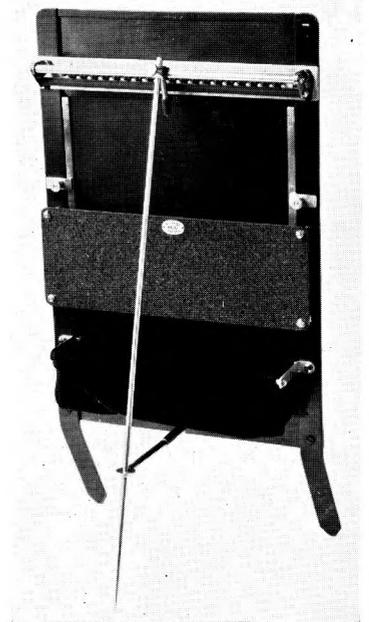


Fig. 39

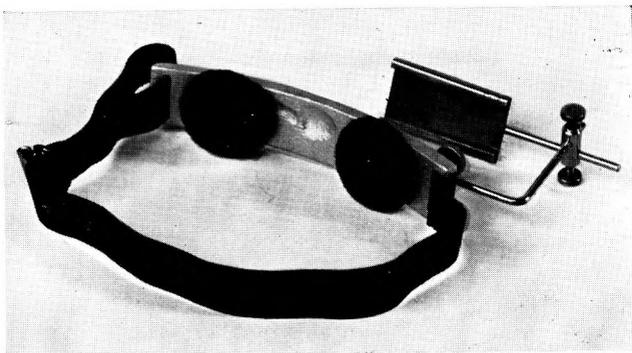


Fig. 36

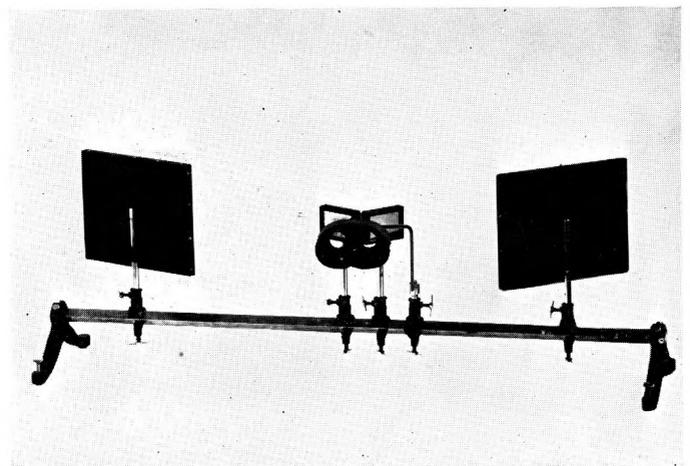


Fig. 40

size of the color area is controlled by means of a diaphragm. The various filters are placed in position in front of the lamp by means of a control on the back of the box. The exposure is effected, and the duration of it controlled by a camera shutter mechanism. The disturbing factors of expectation and fatigue are more easily controlled than in the usual procedure. - - -

\$ 95.00.

V6001 Monochromatic Colorimeter (Description & price on application).

V6002 Dichromatic Colorimeter (Description & price on application).

V6003 Trichromatic Colorimeter, Additive Type
(Description and price on application).

V6004 Trichromatic Colorimeter, Subtractive Type
(Description and price on application).

V6005 Standard Spectrophotometer (Description and price on application.)

V6006 Marietta Color Analyzer. This device provides a practically useful, Fig.43. rapid and inexpensive method of analysis by using a set of approximately monochromatic filters. It eliminates much of the tedium and inexactness of suspended judgment which occurs in the equality of brightness method. To this end, a "ladder" effect is secured in the comparison field, by introducing a short neutral tint wedge, the surface of which is interrupted by narrow opaque strips producing three horizontal fields of slightly different brightnesses. The judgment of equality is thus facilitated by the judgment of "greater" and the judgment of "less" which the upper and lower fields when the central field is balanced with the test field. By this means the judgment of equality is made with much greater ease, rapidity, and certainty.

It overcomes the difficulties of securing accurate readings of very small intensities. The ordinary spectrophotometer encounters both a mechanical and visual difficulty in this regard. Photometer devices such as the sector disk, and the adjustable wedge present a mechanical difficulty in making very small changes, such as small fractions of one percent. Also at such small measures the amount of light reflected calls for considerable dark adaptation to secure accuracy of comparison. To overcome such difficulties, the Marietta Color Analyzer combines two principles, namely that of the inverse square law and that of the differential Maxwell disks. Black and white disks of known reflection coefficients, controlled by differential rotator, are used on the one hand, while on the other the point source of light is moved as close as necessary to the (dark) sample. The reading for percent of white is afterward corrected to compensate for the differences in distance between the light and the two surfaces. Thus the mechanical and the visual difficulties are both overcome at the same time. - \$ 155.00.

V7001 Donder's Test. The Edridge-Green Lantern. This tester consists of four disks which may be revolved separately, affording a considerable variety of colors, with smoked and ribbed glasses to simulate fog and snow. The disk is illuminated by electric lamp. - - -

\$ 97.00.

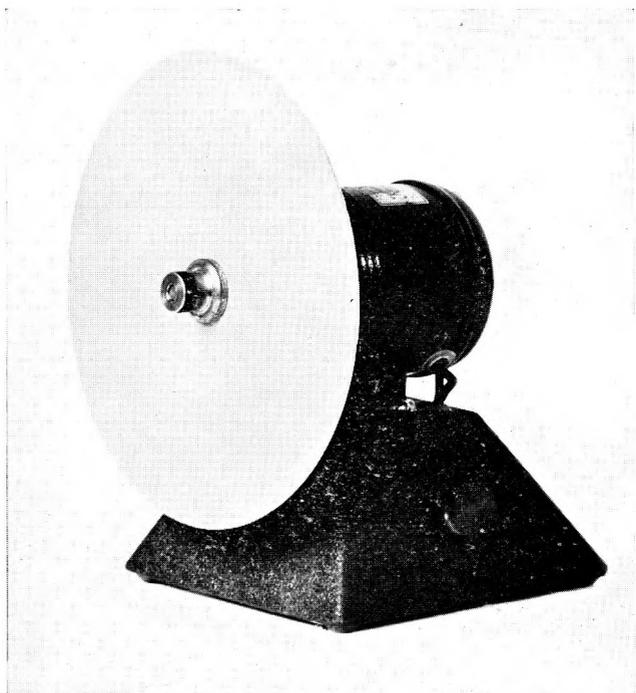


Fig. 41

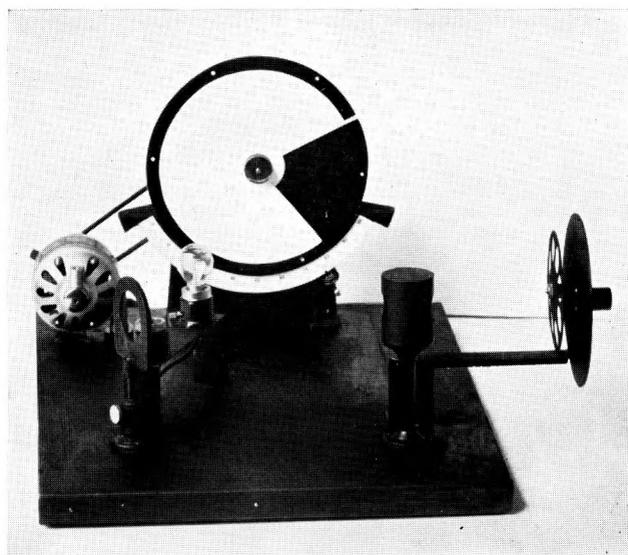


Fig. 43

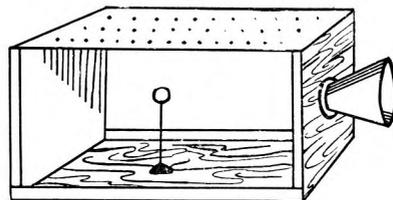


Fig. 44

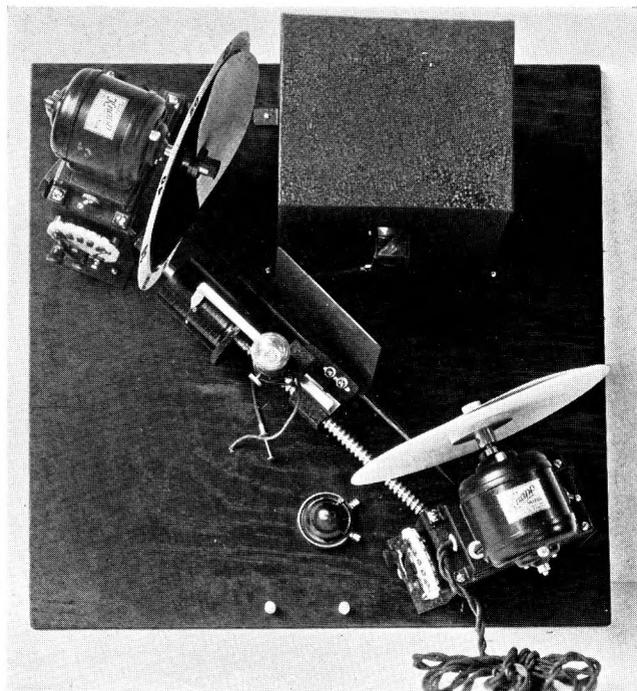


Fig. 42

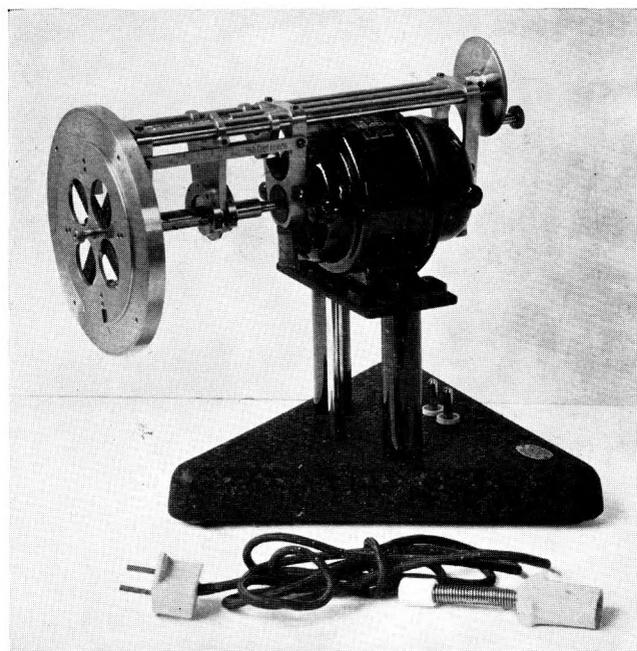


Fig. 45

V7002	Scripture's Test. In the front of this device are three windows, filled with dark smoked glass, ground glass, and light smoked glass respectively. The back of the instrument consists of a movable disk carrying twelve glasses of different colors, mostly reds, greens, and grays. The most important merit of the instruments described by its inventor is its usefulness in detecting the presence of color weakness. This is the Donders principle in a much simplified form. It is ordinarily to be used with daylight.	-	-	-	\$ 45.00.
V7003	The Williams Lantern. This device contains a disk holding 18 pieces of colored glass, seven shades of red, five of green, two of blue, one purple, one yellow, one smoked, and one clear. It is so illuminated that one, two, or three lights may be made visible at one time. Equipped with rheostat.				\$ 83.00.
V7004	The Thomson Lantern. Similar in general principles to V7003, equipped with two disks, each containing seven test glasses. The disks can be used separately or in combination.	-			\$ 63.00.
V7006	Jennings Test. This set consists of two boards each bearing a set of 64 colored skeins, with a perforation opposite each skein. There are also a set of test skeins. A record blank is placed underneath each color board, and the subject is asked to make a mark in the perforation opposite each sample which in his opinion matches the test skein presented.	-			\$ 27.00.
V7007 A	Holmgren Test, 125 colors	-	-		\$ 15.00.
V7007 B	Holmgren Test, 100 colors	-	-		\$ 12.50.
V7007 C	Holmgren Test, 40 colors	-	-		\$ 10.00.
Fig.31	A set of colored worsted yarns with metal tags. The odd numbers on tags denote match skeins and even numbers confusion skeins. Skeins 1 to 20 consist of various shades and tints of green alternating with confusion colors, grays, tans, light browns, etc. Numbers 21 to 30 indicate darker shades or rose alternating with blues and numbers 31 to 40 indicate reds alternating with browns, sages and dark olives.				
V7011	Stillings Test. (18th Edition) This well known test, adopted by the U. S. Navy, U. S. Army and many other institutions, consists of a series of color plates composed of color mosaics so arranged as to reveal patterns to normal vision but not to the color weak or color blind. This last edition contains several new plates which considerably extend the range of usefulness of this standard test, including the testing of illiterates.	-	-		\$10.00
V7012 (Fig.28)	Ishihara Test. This test incorporates the same principle as the Stillings Test. It consists of sixteen plates, some of which are very ingenious. For instance, on one plate the color blind sees a figure which is imperceptible to the normal eye.	-	-	-	\$10.00

- V8001 Hering Falling Beads Apparatus. - - \$ 26.00.
 Fig.44 The observer looks through a tube and slit into a box which is open on both sides. In the box there is set up at any desired distance a little standard with a white knob which stands out clearly against the background. While the eye is fixed on this, beads are allowed to drop through the small holes which are arranged one centimeter apart in the cover of the box, and in each case the observer is to decide whether the bead has fallen in front of or behind the knob. The purpose of using falling beads instead of fixed objects is to avoid parallax displacements such as would occur in case of movements of the head and eyes. Since moreover the beads are different in size, the only criterion for determining the distance of the falling bead from the knob, when one eye is used for observation, is the degree of clearness, whereas disparation comes into play when both eyes are used. Since one's judgment is correct when both eyes are used, but very uncertain and often absolutely incorrect when one eye is used, the experiment shows in a clear way the importance of binocular vision for the determination of depth.
- V8002 Hillebrand Edge Apparatus. - - \$ 64.00.
 The purpose of the apparatus is to present to the eye objects at different distances in such a way that the judgment of the distance is possible only on the basis of accommodation. On a horizontal flat base there is fixed a short vertical axis about which revolve two horizontal arms. On these arms, slides carry vertical screens. The inner vertical edges of these two screens, which are the objects that are to be judged as to distance, are sharp and exactly parallel thus excluding all secondary clues to the determination of depth. The eye of the observer is over the center of rotation of the two arms, and looks through a short removable tube with an elliptical opening toward the front. The tube is placed in a screen which conceals the other parts of the apparatus. The background is formed by the frosted glass which is illuminated by lamps. The two arms are so joined by a curved piece at the far end that, when they are turned the edge of one screen comes into the field of vision at the very instant when the edge of the other screen has left it. In this way a quick change of the two objects can be brought about.
- V8101 Reflection Stereoscope, Wheatstone. Simple model.
 Fig.35-3 Consists of a pair of vertical mirrors set at an appropriate
 Fig.35-4 angle, and a pair of vertical support frames for carrying
 the stereoscopic cards. - - \$ 37.00.
- V8102 Reflection Stereoscope, modified by Hering. (Known as the
 Mirror Haploscope.) A more elaborate model of the Wheatstone
 principle. - - \$125.00.
- V8103 Demonstration Reflection Stereoscope. (Titchener's combined
 Fig.40. Stereoscope, Telestereoscope and Pseudoscope) - \$ 75.00.
- V8104 Refraction Stereoscope, Brewster, Simple form. - \$ 2.00.
 Fig.38.
- V8105 Refraction Stereoscope, Removable partition - \$ 7.50.

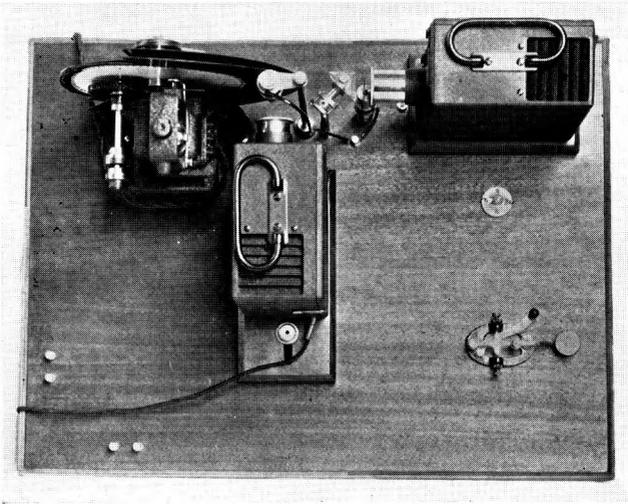


Fig. 46

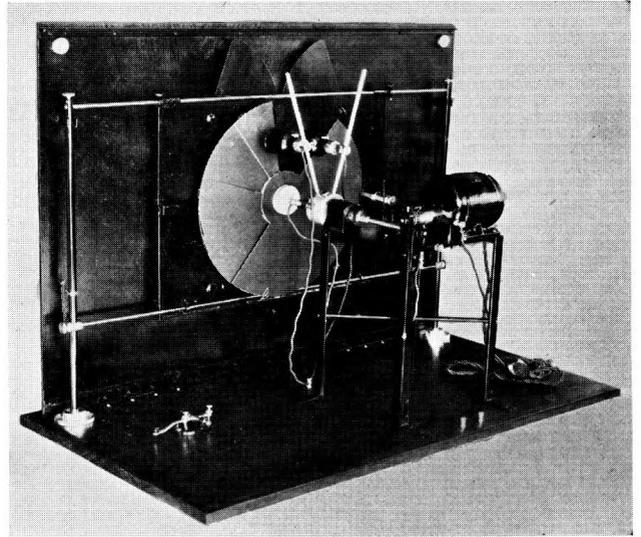


Fig. 49

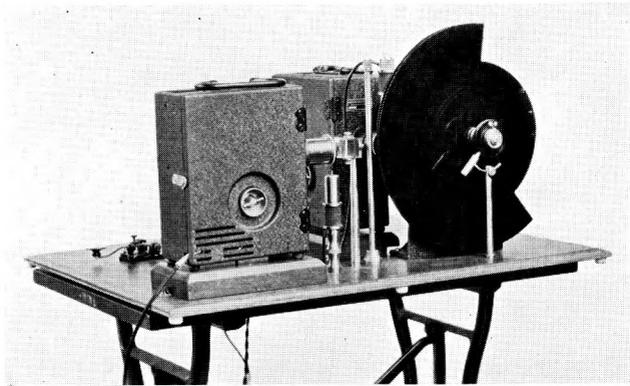


Fig. 47

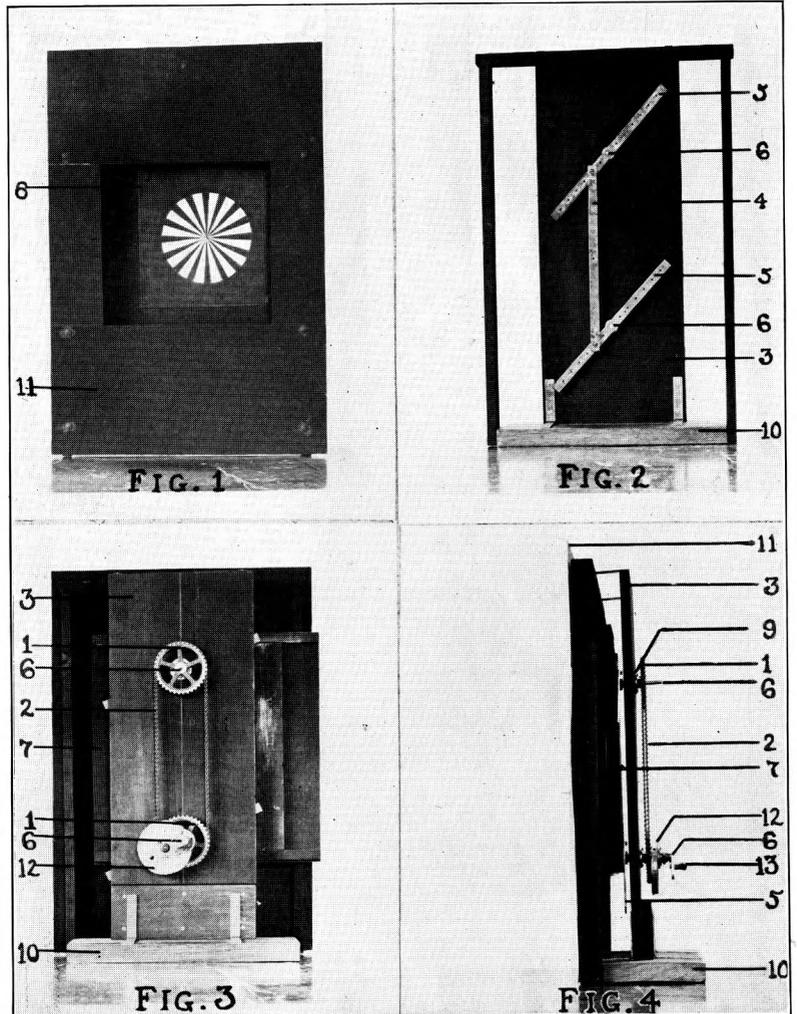


Fig. 50

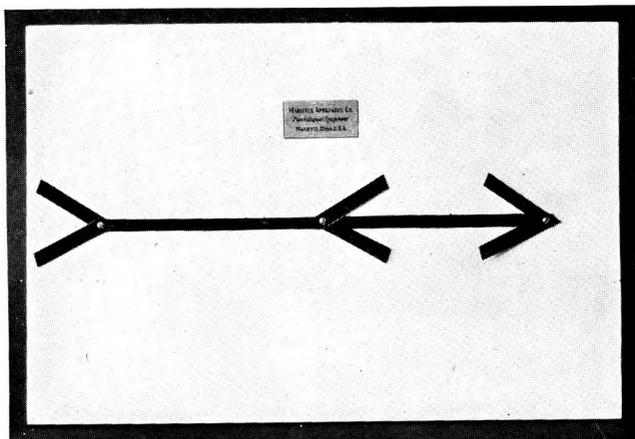


Fig. 48

V8106	Refraction Stereoscope, with clips for auxiliary prisms.	-	\$ 7.00.
V8107	Refraction Stereoscope, Brewster, with differential prisms (opposite revolving pairs)	-	\$47.00.
V8108	Tube Stereoscope (Ludwig's Tropostereoscope)	-	\$37.50.
V8109	Tube Stereoscope, special type known as the "amblyscope" suitable for detection, and correction by practice, of various forms of heterophoria.	-	\$23.00.
	With electric illuminating attachment	-	\$52.00.
V8111	Filter Stereoscope, often called "anaglyph", "plastograph" etc. Consists of two-colored stereograms with paired color filters for observation. Especially useful in emphasizing the function of double images, as the stereograms are superimposed one on the other, and the "crossed" and "uncrossed" disparities are very obvious. Per dozen	-	\$ 3.00.
V8112	Binocular Alternation Stereoscope, (Münsterberg.) Similar in general appearance to the Stroboscope, but has slits for right and left eyes in alternating positions 30' apart, and the corresponding right and left halves of the Stereograms in a circle at successive positions 40' apart.		\$ 45.00.
V8113	Projection Stereoscope. Polarizing Type (Scripture). Uses a pair of projectors, before the objective of one of which is a vertical polarizer, and before the other a horizontal polarizer. The observer uses an eye piece consisting of a pair of analyzers. (Price on application.)		
V8114	Projection Stereoscope. Filter Type. Similar in principle to the "anaglyph," Set of 5 slides, and pairs of projection filters and of observing filters.	-	\$ 25.00.
V8115	Projection Stereoscope. Synchronized Alternation Type. Projection shutters and observation shutters synchronized. Similar in principle to the Münsterberg device, V8112. (Price on application.)		
V8117	Mirror Pseudoscope Fig.35-5	-	\$ 65.00.
V8118	Mirror Pseudoscope Fig.35-6	-	\$ 45.00.
V8119	Total Reflection Pseudoscope (Wheatstone-Dove)	-	\$ 72.00.
V8120	Lenticular Pseudoscope (Wheatstone-Wood)	-	\$ 35.00.
V8121	Stereoscopic Cards. Combination Set. This set consists of 5 parts, with a total of 50 cards, arranged as follows:	-	\$ 17.50.
	Part I Heterophoria Cards		
	Part II Fusion and Rivalry Cards		
	Part III Stereograms (Geometrical designs)		
	Part IV Stereoscopic photographs		
	Part V Lustre Cards		

V8201	Illusion Cards. Set of 10 cards. Size about 4x5 inches	\$ 7.50.
V8202	Arrow Head Board - - -	\$10.00.
V8203	Illusion Card. When rotated shows various illusions of motion effects. (Also shows the Benham disk color phenomena. - - -	\$ 1.00.
V8204	Anglo Illusion Card. The superimposed black cut out card swings out of position showing the straight line, and back into position showing the angle illusion -	\$ 2.00.
V8302	Stereoscopic Motion Apparatus, Filter Type. This device is designed for individual use. To the variation in disparity is added a suitable variation in size of images. The variation of disparity is produced by the rotation of two sets of paired prisms, while the change in size is secured by a pair of diaphragms. - - -	\$ 78.00.
V8303	Antirheoscope (James). Apparatus for illusion of reverse motion. - - -	\$ 43.50.
V8305	Illusion of motion apparatus. This device provides a means for presenting pairs of luminous stimuli at variable distances, variable intervals and in variable directions from each other. Two radial arms carrying lights which may be at variable distances from the hub may be separated by a variable angle and rotated at controllable speeds. Paired apertures in the screen may be arranged in a great variety of positions and illuminated at desired intervals and sequences. - - -	\$ 115.00.
V8306	Illusion of motion apparatus. This piece of equipment is offered through the courtesy of Leonard Carmichael and Harold Schlosberg, Brown University. For discussion of the use of this device see The American Journal of Psychology, January, 1928, from which the following brief description is quoted. The cut, (figure 50) is here used through the courtesy of this journal.	\$75.00.

" The present machine makes it possible to present under controlled and varied conditions, all of those visual illusions that depend upon what has been termed by Thompson, from its similarity to the movement used in cleaning a dish, a rinsing motion. A rinsing movement may be described as a movement in which the stimulus-object is revolved in a circle, at a given distance from the center, but maintains a fixed orientation so that it does not rotate about an axis within itself.

Among the factors that it is possible to vary when the device here described is used, beside the actual form and color of the stimulus patterns, are: 1) the speed of the rinsing movement; 2) the extent of the excursion, i.e. the distance of the circle inscribed by the center of the stimulus design from the true center of rotation; and 3) the distance of the O from the object.

Essentially, the device consists of two sprockets of an equal number of teeth, coupled by means of an endless chain, so that when one sprocket is driven, the other also turns at an equal rate of speed. Thus all corresponding radii of the two sprockets always remain parallel and when a connecting yoke or strip is attached by a pivot to a pair of these corresponding radii, at points equi-

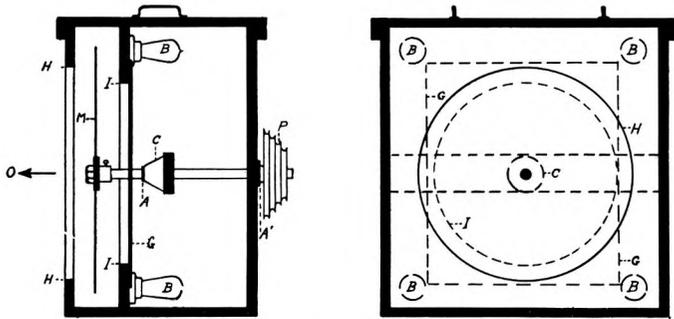
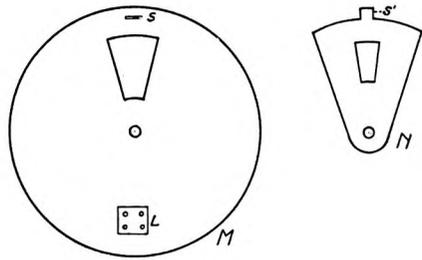


Fig. 51

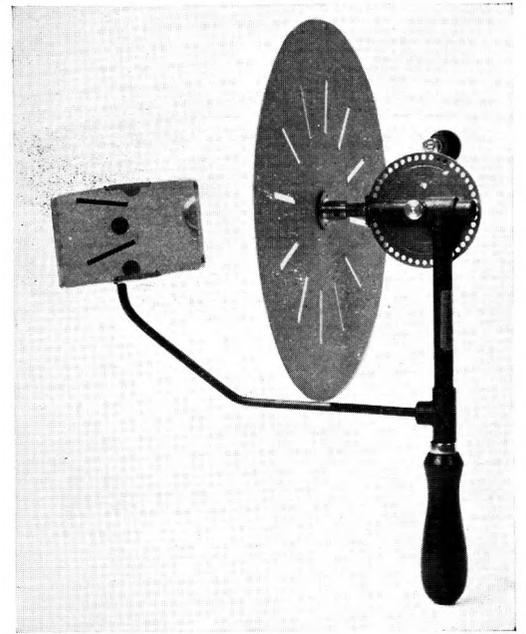


Fig. 53

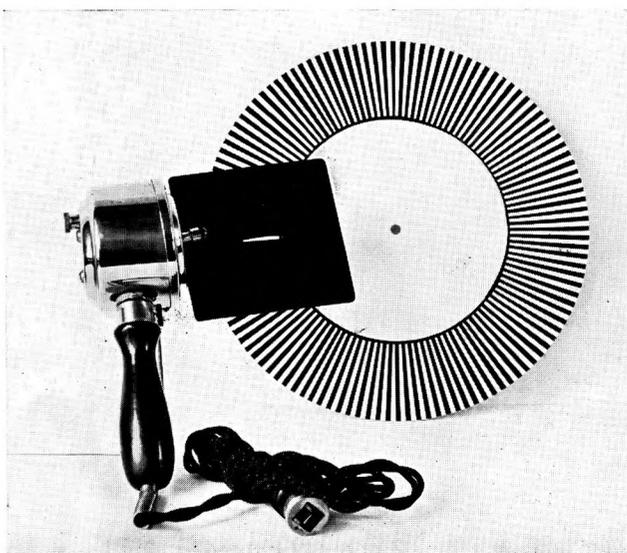


Fig. 52

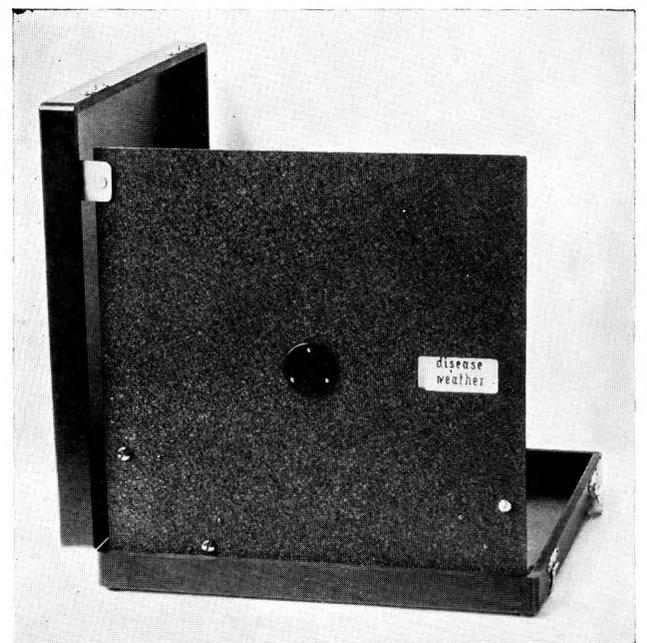


Fig. 54

"distant from their respective centers, this yoke will be moved with a circular motion, but not rotated; i.e.the motion imparted to the yoke will be the rinsing motion previously described.

In the following description the numbers in parentheses following the names of the parts refer to the indicated points in the accompanying cut. The sprockets 1) and chain 2) are placed behind the upright support 3). The yoke 4) is attached to arms 5) mounted on the same shafts 6) as the sprockets, but on the opposite side of the upright support 3). A board 7), made of soft wood, is mounted on the yoke, and to this base the stimulus patterns 8) may be attached by means of thumb tacks.

The device may be operated by hand by means of a crank 13) or by a small electric motor and reducing gears. A range of 50-400 R.P.M. will be great enough for the demonstration of most of the illusions requiring this type of motion. "

V8307 Fig.52	Illusion of Motion Apparatus. Consists of a cardboard disk containing 120 radial stripes, to be placed on the turn table of a phonograph, and rotated at approximately one revolution per second. It is viewed through an intermittent shutter mounted on an A.C. vibrator.	- -	\$17.00.
V8308 Fig.53.	Illusion of Motion Apparatus	- -	\$19.00.
V8309	Illusion of Motion Apparatus. This device uses the same stroboscopic radial stripe disk as V8307, but rotates it by means of variable speed motor suitably mounted for class room demonstration. The upper half of the disk is shielded from daylight, and is illuminated by neon lamp, which on 60 cycle A.C. current gives 120 clean cut flashes per second. With proper regulation of the rotation rate of disk, the stripes appear to move slowly forward, slowly backward, or stand still. Equipped with induction motor having centrifugal governor.	- -	\$ 45.00.
V9001 Fig.46 & & 35-15	Projection Tachistoscope. This instrument consists of a pair of film projectors and variable sector timing disk. The latter is rotated at one revolution per second by small self-starting synchronous motor. The disk openings provide various fractions up to 1/5 second. The rotation automatically ceases at end of one revolution. The exposure material is printed on non-inflammable standard width film, and consists of about 150 "frames" of digits, letters, nonsense-syllables and words. The double projector method provides for accurate control of relative brightness of preexposure and exposure field. Especially suitable for group use.	- -	\$ 142.00.
V9002 Fig.34.	Tachistoscope. Pendulum Disk Type. Contacts for electrical time marker to indicate exact duration of exposure. The rate of fall is regulated by means of variable pendulum bob, and variable open sector. Exposure limits, 49 and 9 hundredths of a second. Size of exposure window, about $4\frac{1}{2}$ x $1\frac{3}{4}$ inches. The whole mechanism is mounted in a case about 3 x 14 x 14 inches, the lid of which when open serves to support the instrument in the vertical plane.	- -	\$ 50.00.

V9003 Tachistoscope. Drop type, with contacts for electrical time
 Fig.37. marker to indicate exact duration of exposure. The rate of
 fall is regulated by means of an adjustable brake, operating
 on the guide bar. The exposure window is about 3" x 7 $\frac{1}{2}$ ".
 The whole mechanism is mounted in a case about 2 x 14 x 14
 inches, the lid of which when open serves to support the
 instrument in the vertical plane. - - \$ 37.50.

V9004 Tachistoscope. (Falling Ball Type.) This consists of an
 Fig. 39. upright metal screen about 27 inches high and 15 inches
 wide. On the back of the screen, at the top, is a row of
 equally spaced pins projecting horizontally. Across the
 openings between the pins is a bar parallel to the screen
 which serves as a support for steel balls placed between the
 pins. This bar may be moved away from the screen by means of
 a small lever. This action causes the balls to fall at the
 same instant. The maximum opening of the exposure window
 reveals the falling balls for 1/20 of a second. A scale on
 the back of the screen indicates nine other opening widths.
 Each scale division indicates a difference in exposure time of
 5 thousandths of a second. The width of the opening is easily
 regulated by means of two finger nuts. - - \$ 48.00.

V9101 Exposure Apparatus. Mounted in a wooden case about 14 x 14 x 2
 Fig.54 inches, which when opened, serves as an operating support,
 this device consists of a disk about 11 inches in diameter,
 divided into 21 sectors, on each of which is printed a stimulus
 word. An opening in the case serves as an exposure window
 (about 1 x 2 $\frac{1}{2}$ in.). The disk is moved by means of a ratchet
 device that arrests each sector in proper position before the
 window. - - - \$ 50.00.

V9102 Exposure Apparatus. The material is printed on strip of standard
 Fig.55. width moving picture film. Each "frame" is placed in position
 by means of a cable release. The device is mounted in a carry-
 ing case about 13 x 13 x 3 inches. The exposure window consists
 of an aperture in the cover of the case. - \$ 80.00.

V9103 Reading Tachistoscope. This piece of equipment is offered
 Fig.35. through the courtesy of Francis P. Robinson, The Stout
 Institute. For discussion of the procedure for which this
 device was developed, see the American Journal of Psychology,
 January, 1934, from which the following brief description is
 quoted. The cut, (figure 35) is here used through the courtesy
 of this journal.
 " It will be noted that this exposure device allows the reading
 of the printed material (as much as 20 lines) down to the shield
 (A) which covers one line. When O reaches the end of the last
 visible line and jumps back to where the first of the next line
 will begin, he presses the key (B) which causes the covered line
 to be exposed for 100 σ . The pressing of this key releases an
 unbalanced rocker-arm switch which has contacts on either end.
 During part of the swing of the falling arm, both contacts are
 out of their mercury cups which breaks the circuit to the magnets
 that hold the exposure arm up. The distance of the fall of this
 rocker-arm determines the interval of exposure. Thus the time
 interval can be changed by raising or lowering the mercury cups.
 The P.E. of such a timing device is about 4 σ . The reading lamp
 (C) illuminated the material and the mirror (D) is used for check-
 ing the location of the reading material as it is rolled up on
 roller (E) after each exposure. To obtain the usual tachisto-
 scopic set-up, single sentences were exposed behind this arm with-
 out any preceding reading matter."

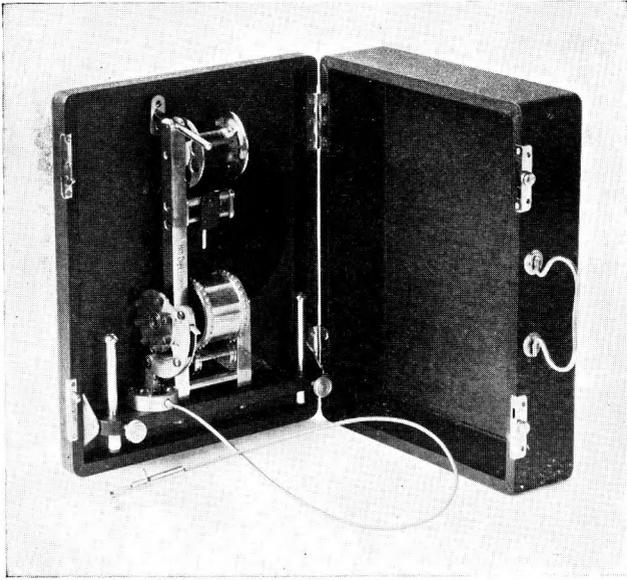


Fig. 55

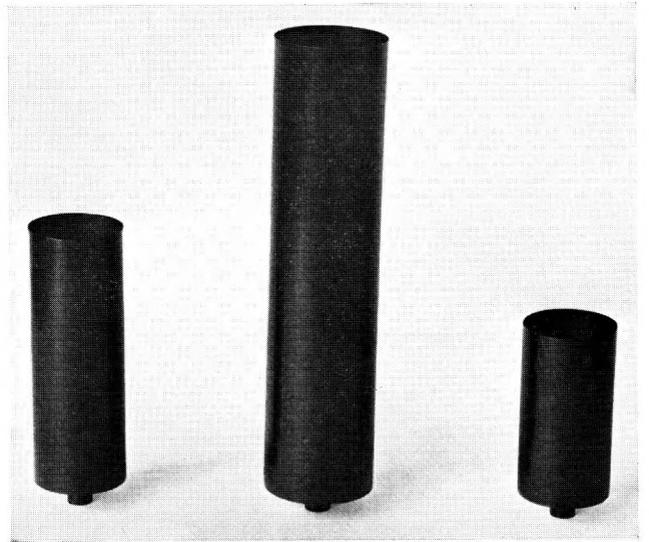


Fig. 60

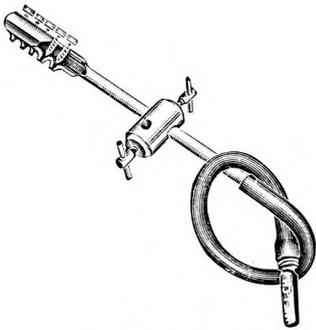


Fig. 56

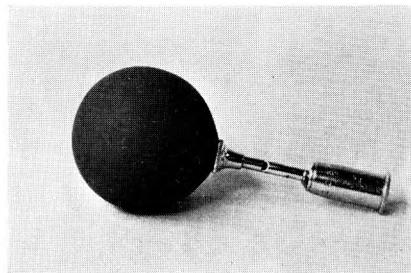


Fig. 58

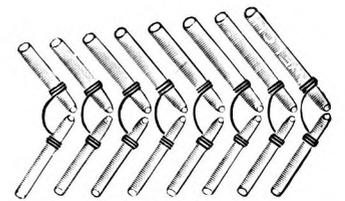


Fig. 61

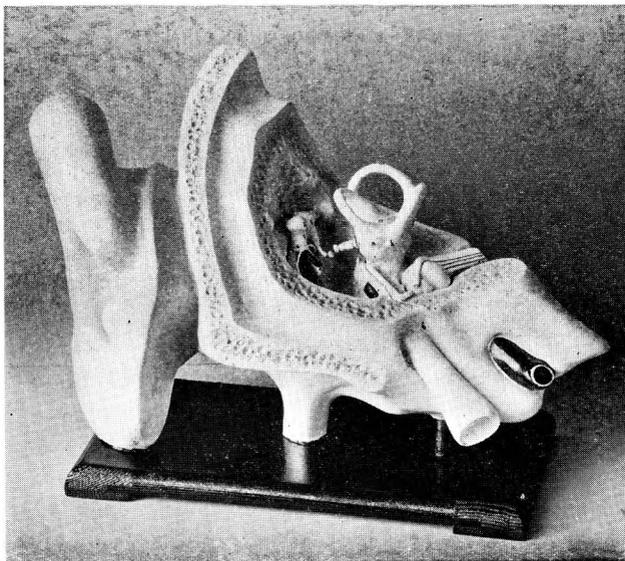


Fig. 57

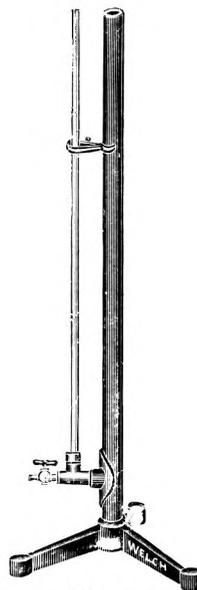


Fig. 59

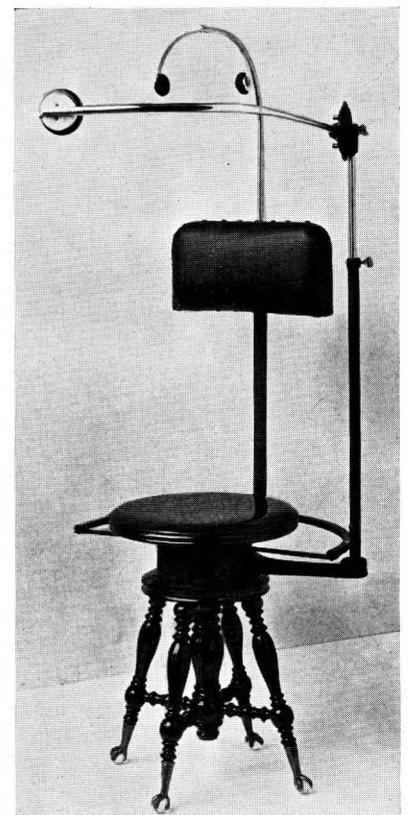


Fig. 62

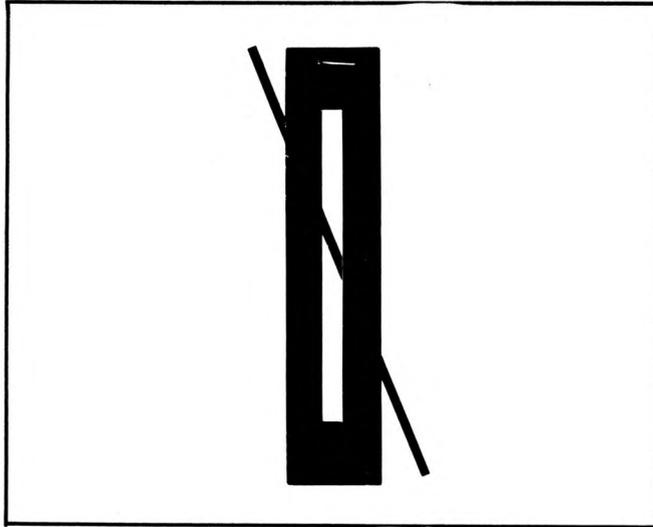


FIG. 35-13

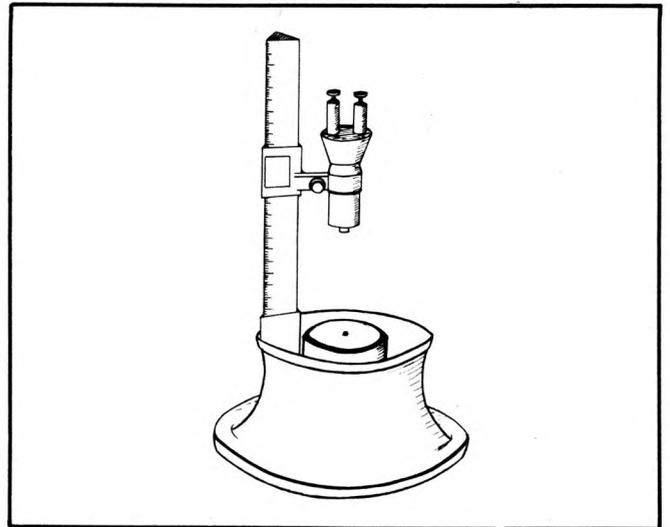


FIG. 35-16

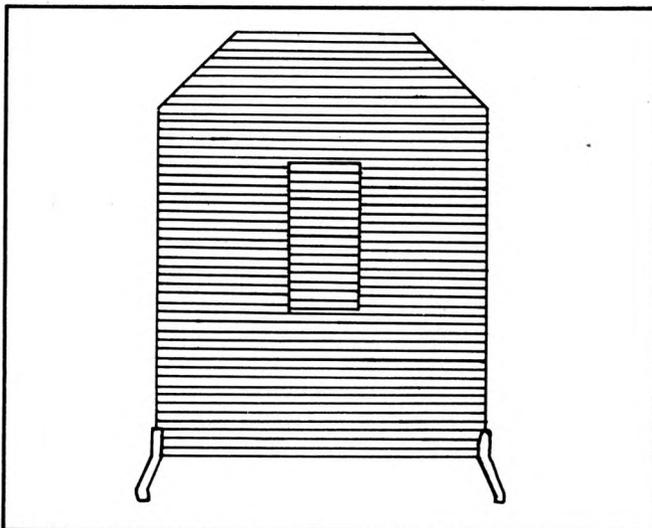


FIG. 35-14

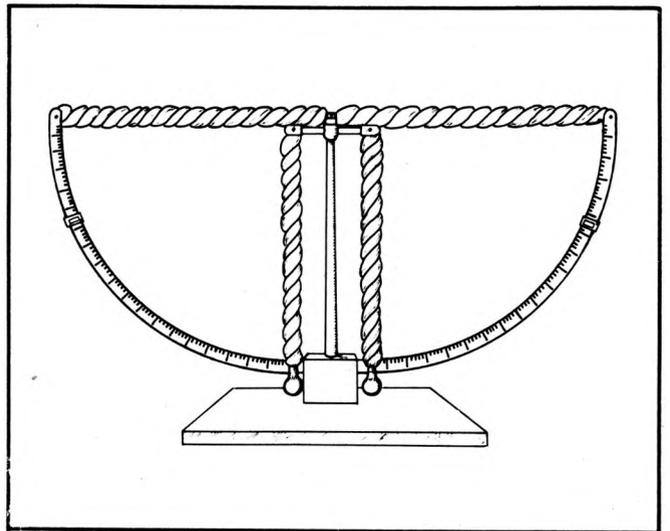


FIG. 35-17

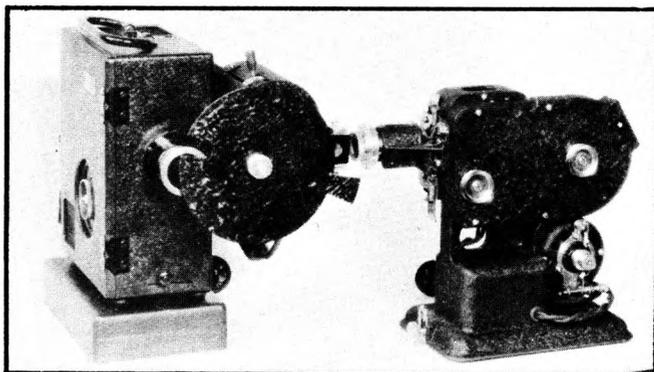


FIG. 35-15

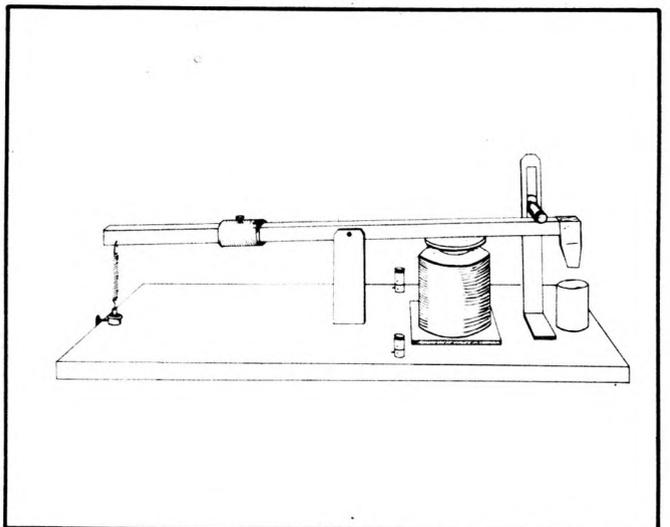


FIG. 35-18

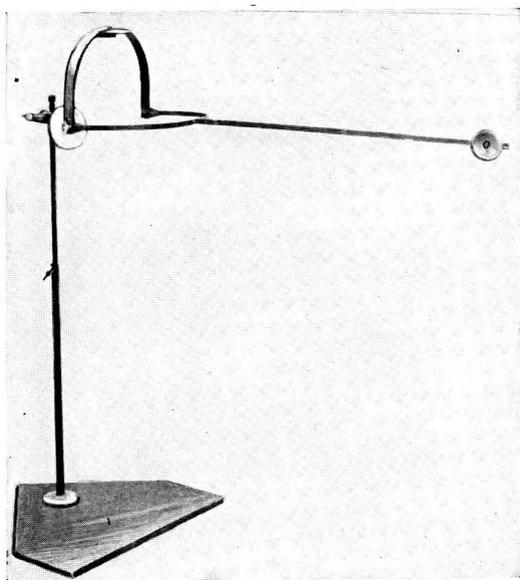


Fig. 63

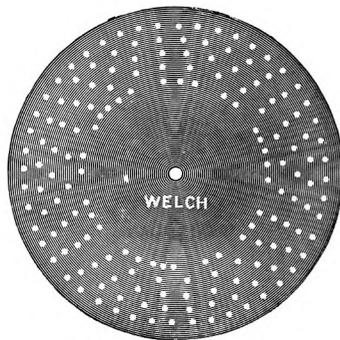


Fig. 69

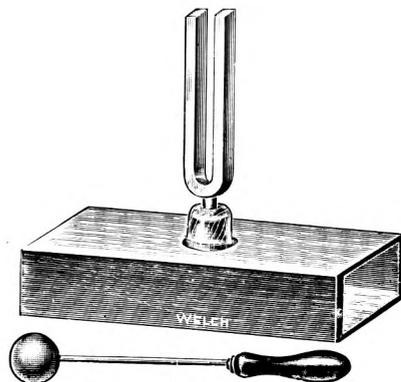


Fig. 70



Fig. 71

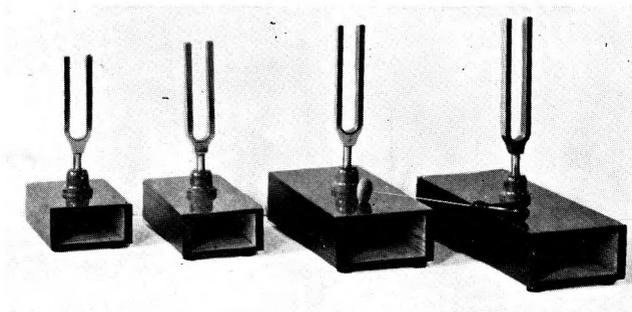


Fig. 72

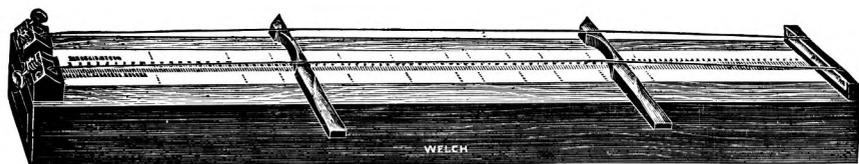


Fig. 64

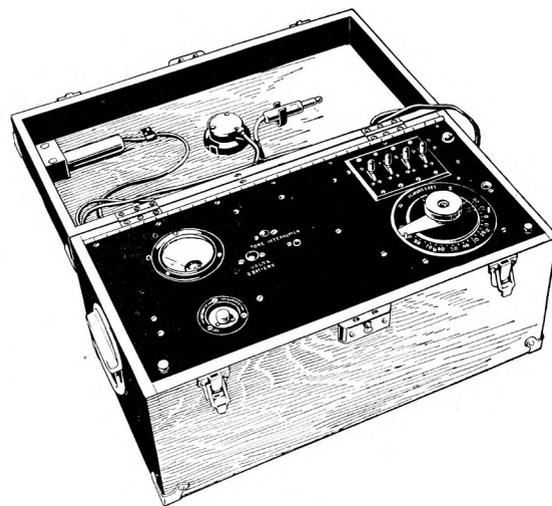


Fig. 73

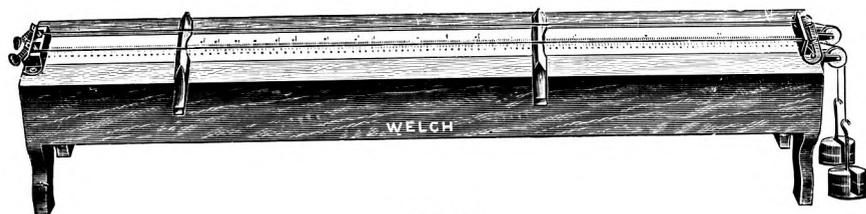


Fig. 65



Fig. 66

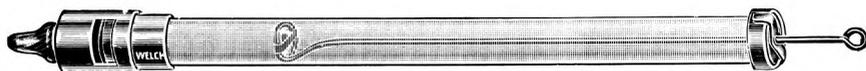


Fig. 67



Fig. 68



Fig. 74

A-1001	Model of Ear Fig.57	-	-	-	\$ 35.00.
A-2002	Waggener Sound Wave Slide. Consists of five wire forms, the rotation of which demonstrates very effectively the geometry of wave motion. Mounted for use with a projection lantern	-	-	-	\$ 19.00.
A-2003	Wave Apparatus (Ames and Bliss). Consists of a spring steel strip about 12 feet long to which are attached at regular intervals a series of metal cross bars carrying metal balls at each end. Demonstrates both transverse and longitudinal propagation.	-	-	-	\$ 13.00.
A-2004	Crova's Disk	-	-	-	\$ 1.00.
A-2005	Tuning Fork (Adjustable. Range one octave. Unmounted.)	-	-	-	\$ 1.50.
A-2006	Tuning Forks (Adjustable weights. C to F sharp and G to C.) Per Pair	-	-	-	\$ 4.00.
A-2007	Tuning Fork (Mounted on good quality resonance box with Fig.70. hammer. Single fork C, E, G. or C'.)	-	-	-	\$ 7.00.
A-2008	Set of Tuning Forks (Four, C, E, G and C', mounted as Fig.72. above.) Per Set	-	-	-	\$ 22.00.
A-2009	Set of Tuning Forks (Eight forks, C-C', mounted as above) Per Set	-	-	-	\$ 40.00.
A-2010	Set of Tuning Forks (One octave, unmounted.) Per Set	-	-	-	\$ 15.00.
A-2011	Tuning Fork Weights (Pair of nickel plated adjustable weights, with thumb screw, to fit any of above.) Per Pair	-	-	-	\$ 1.65.
A-2012	Disk Siren (Diameter 25cm. Toothed edge. Five rows of Fig.69 holes, four giving major chord, and fifth unequally spaced, producing noise only.)	-	-	-	\$ 3.00.
A-2013	Disk Siren (Same as above, but with eight rows of holes giving octave of diatonic scale.)	-	-	-	\$ 4.00.
A-2014	Disk Siren (Same as II-2-12 but with smooth edge.)	-	-	-	\$ 2.50.
A-2015	Disk Siren (Same as II-2-13 but with smooth edge.)	-	-	-	\$ 3.50.
A-2016	Air Jet Attachment (For use with Disk Siren.) Fig.56	-	-	-	\$ 4.25.
A-2017	Organ Pipe - Metal, Pitch E Fig.68	-	-	-	\$ 3.50.
A-2018	Organ Pipe - Metal, Sliding Piston. Fig.66	-	-	-	\$ 7.50.
A-2019	Organ Pipes (Set of four, with air chest and valves.)	-	-	-	\$ 60.00.
A-2020	Organ Pipes (Full octave set, with air chest and valves.)	-	-	-	\$ 78.00
A-2021	Organ Pipe (With sliding piston, two octaves, tones and semitones marked on piston.)	-	-	-	\$ 12.00.

A-2022	Pitch Pipe (Adjustable through one octave.)	-	\$	1.25.
A-2023 Fig.61	Quincke's Tubes (Set of eight whistles, sounding the octave of diatonic scale.)	-	\$	4.00.
A-2024 Fig.59	Resonance Tubes - Reservoir Type	-	\$	15.00.
A-2025 Fig.60	Resonators	-	\$	45.00.
A-2026 Fig.71	Interference Tubes (Quincke)	-	\$	2.00.
A-2027	Acoustic Chart (Kitching's	-	\$	1.00.
A-2028 Fig.64	Sonometer	-	\$	10.00.
A-2029 Fig.65	Sonometer	-	\$	10.50.
A-3001 Fig.58	Galton Whistle	-	\$	7.50.
A-3002 Fig.74	Galton Whistle - Improved Type, by Edelmann	-	\$	65.00.
A-3101 Fig.35-16	Simple Acoumeter - Falling Ball Type	-	\$	42.00.
A-3102 Fig.35-17	Discrimination Acoumeter	-	\$	85.00.
A-3201 Fig.35-18	Sound Hammer	-	\$	75.00.
A-3301	Audiometer (Trimble) (Description on application)	-	\$	285.00.
A-3302 Fig.73	Audiometer (Graybar) This consists of three essential parts:	-	\$	550.00.
	1. An eight frequency Oscillator.			
	2. An Attenuation Potentiometer, for regulating the volume of sound.			
	3. A Receiver.			

The Audiometer is a generator of approximately pure tones which may be varied both in pitch and intensity at the will of the operator. The oscillator has a frequency range which extends from 64 to 8192 double vibrations per second. This range is divided into eight steps of frequency, 64, 128, 256, 512, 1024, 2048, 4096 and 8192 cycles per second. The desired step is selected by the operator by means of one of the keys shown. These keys control the oscillator coils and condensers, and the circuits are arranged so that if two keys are thrown at one time no oscillation is produced, thus preventing incorrect results.

The attenuation potentiometer consists of a resistance network connected to a twenty-four point switch which serves to vary the output of the oscillator. The values of the resistance elements of this potentiometer are such that the movement of the switch

from one point to the next causes a change of five sensation units in the output, the sensation unit corresponding to approximately the smallest fractional change in intensity perceptible to a person of normal hearing.

The receiver is of the watch case type and is of high quality and efficiency.

The signal lamp, operated by a push button, is provided so that the person under test can indicate silently whether the test tone is heard.

A-3303 Audiometer - - - \$ 235.00.

This Audiometer is especially designed for commercial tests and when used for such tests offers the following particular advantages.

It can be operated from a standard 110 volt, 60 cycle alternating current lighting circuit.

The operator need not have medical or technical experience to secure accurate readings, because the instrument is simple in design and easy to operate.

Tests can be made quickly without sacrificing accuracy because of the simplicity of design and the ease of operation.

The tone produced by the audiometer always has the same frequency characteristic and volume when the pointer of the attenuation potentiometer is on the same point.

The readings are given directly in percentages of hearing loss.

The tests and the readings cannot be influenced by the person undergoing the test.

No tests, adjustments, or replacements of batteries or other apparatus are necessary.

Method of Testing

The object of measurement is to determine the faintest tone the person being tested can hear. To determine this the usual procedure is to begin with an intensity which is clearly audible. Upon hearing this tone, the person under test presses the signaling button held in the hand, lighting the signal

lamp. The potentiometer pointer is then slowly turned by the operator towards "0" until the person under test no longer hears the tone. He signals this fact by releasing the button, extinguishing the lamp. Thus the exact measurement of the person's hearing is obtained. By the use of the tone interrupter the operator is enabled to check the accuracy of the signals.

A-3304 Audiometer (Graybar) - - - \$ 175.00.

This Audiometer consists of a spring motor phonograph using a magnetic reproducer instead of the usual acoustic reproducer. The magnetic reproducer picks up the vibrations originated by the record and transforms them into electrical vibrations. These in turn are conveyed to the telephone head set, by this transformed into sound waves, and delivered to the ear of the person or persons under examination who hear as if by telephone. All the necessary electrical energy is developed by the magnetic reproducer. No batteries or other outside sources of electrical energy are required.

The II-2-42 B Audiometer can be arranged so one person alone or as many as forty persons can be tested simultaneously under identically the same conditions.

It is simple to operate as a phonograph and is equally rugged and free from complicated adjustment.

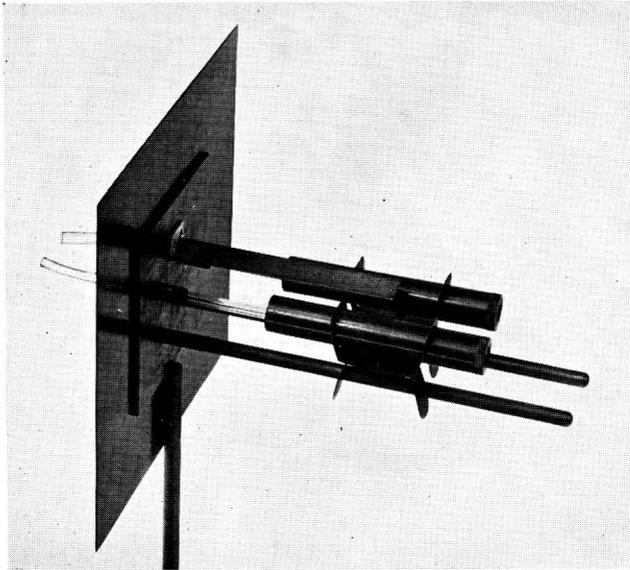


Fig. 75

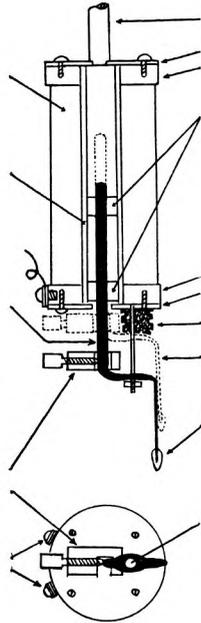


Fig. 78

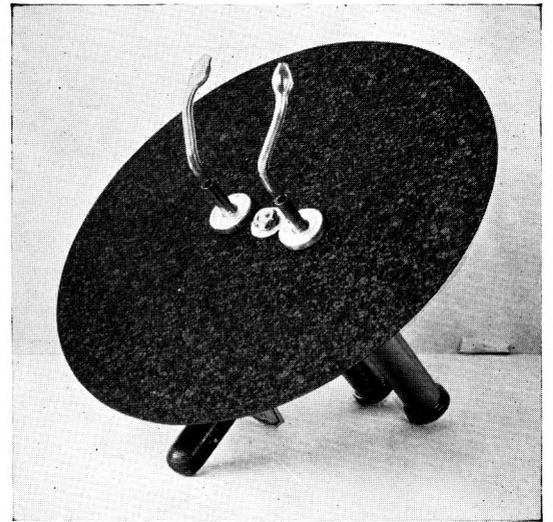


Fig. 79

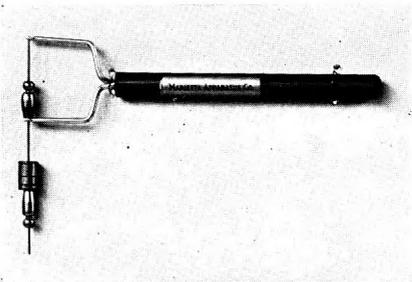


Fig. 76

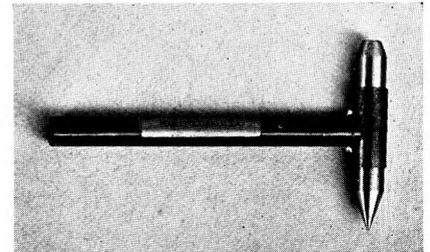


Fig. 80

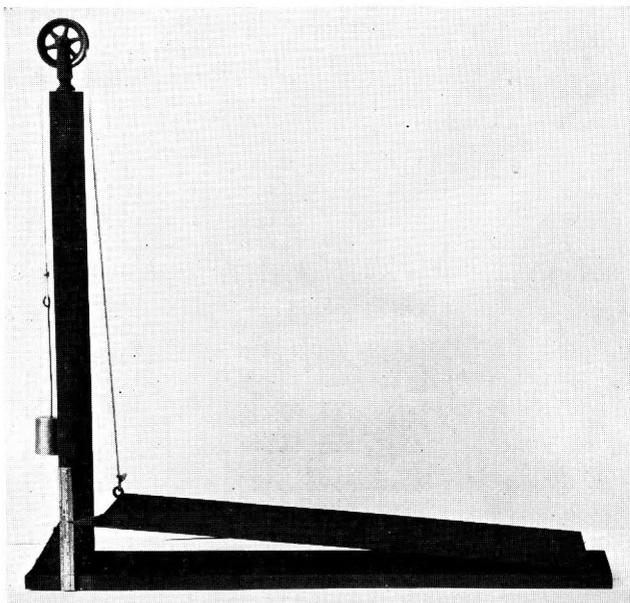


Fig. 77

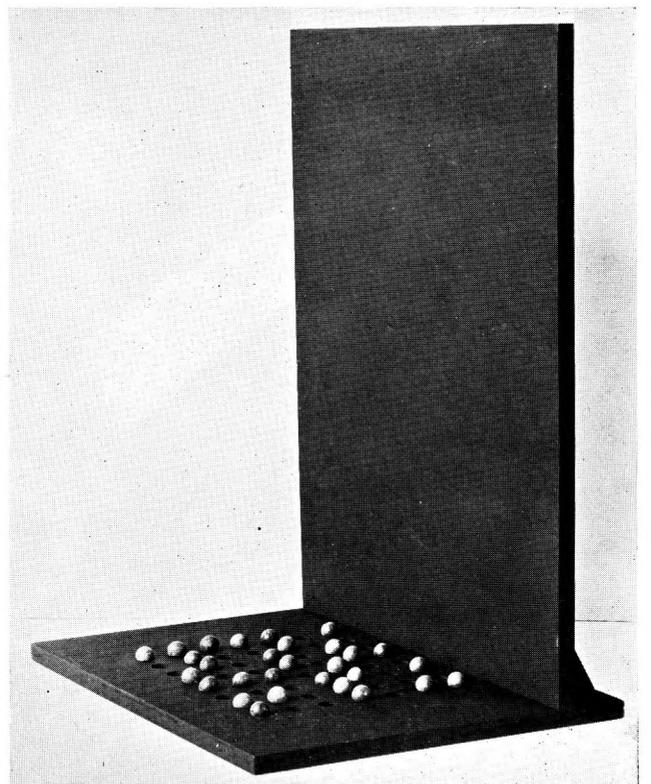


Fig. 81

It avoids the variations that creep into whisper and watch tick tests.

With it, either ear can be tested separately.

The pupil by writing down the numbers heard indicates definitely where in the range of sound the ear recognizes sounds, and is able to interpret them correctly.

A-4001 Fig. 63	Sound Cage	-	-	-	\$ 65.00.
A-4002 Fig. 62	Sound Cage (Titchener)	-	-	-	\$ 175.00.
A-4003	Tonal Apparatus for Phase Control (Trimble) Description on application.				
C-1001 Fig. 75	Olfactometer	-	-	-	\$ 35.00.
C-1002 Fig. 79	Olfactometer	-	-	-	\$ 45.00.
C-1003	Smell Solutions (Set of ten in bottles)			-	\$ 5.00.
S-1001	Rubber Stamp (for cutaneous sense mapping)			-	\$ 1.00.
S-1101 Fig. 76.	Algesiometer.	-	-	-	\$ 5.00.
S-1201 Fig. 80	Temperature Cylinders (Set of six with holder)			-	\$ 3.00.
S-1202 Fig. 35-19	Heat Grill	-	-	-	\$ 5.00.
	This device is offered through the courtesy of Harold Schlosberg, Brown University. For discussion see the American Journal of Psychology, January 1931, from which the following brief description is quoted. The cut, figure 35-19, is here reproduced through the courtesy of this journal.				
	"The new grill consists essentially of two comb-like elements, one of which may be warmed, and the other chilled, by immersion in pans of water. By intermeshing the teeth, and placing them on the surface of the skin, alternate warm and cold rods stimulate the skin.				
	"The experimenter places one element in cold water (about 20°C), and the other in warm (about 40° C). He allows several minutes for the elements to come to the temperature of the bath, then removes them and shakes them free of water. The rods are then intermeshed. The S then rests his wrist, and later his palm, on the intermeshed alternate warm and cool rods. An experience of heat is almost invariably reported.				
S-1301 Fig. 78 Fig. 35-20	Electromagnetic Aesthesiometer. This device is offered through the courtesy of Wilbur S. Hulin, Princeton University. For discussion see the American Journal of Psychology, July 1929, from which the following brief description is quoted. The cut, figure 78, is here used through the courtesy of this journal.				

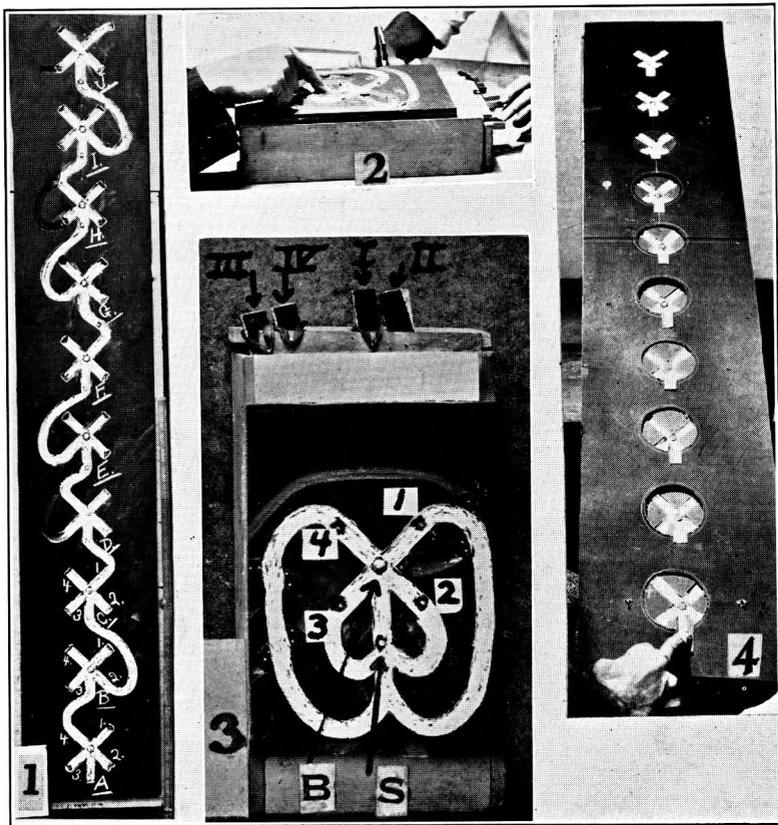


Fig. 82

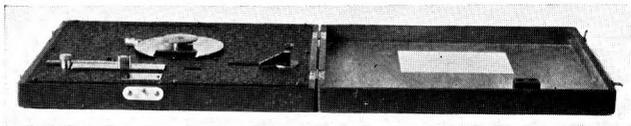


Fig. 83

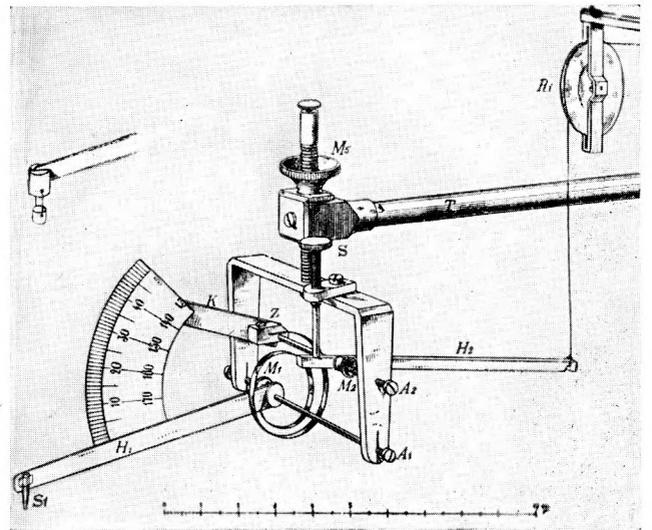


Fig. 86

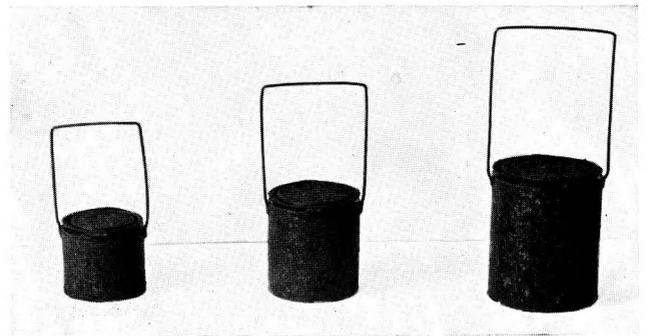


Fig. 87

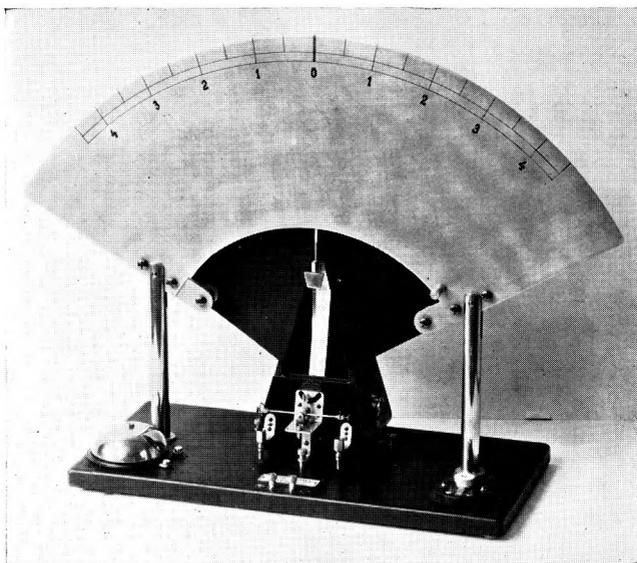


Fig. 84

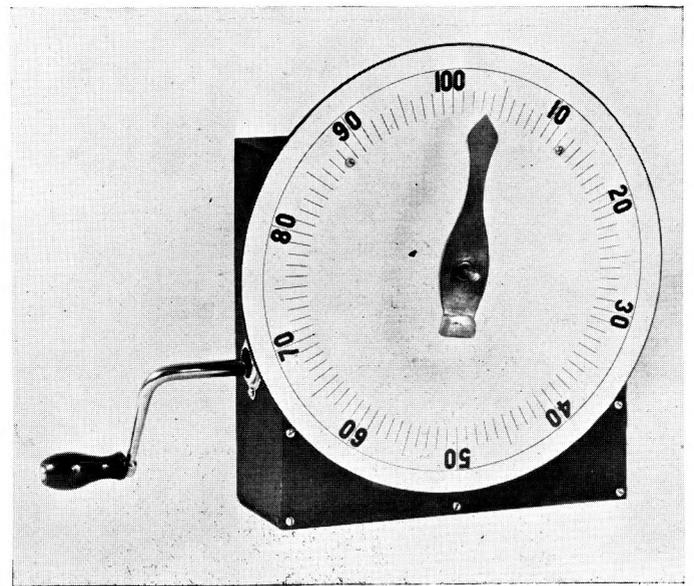


Fig. 88

"The instrument consists of a solenoid within which an iron plunger is held suspended as long as the circuit is completed through the coil. When the circuit is broken the iron plunger (i.e. the stimulus-point) descends upon the skin by gravity. The intensity of the stimulation is determined by detachable brass slots (grooved so as to be fastened with a set screw to the iron plunger above its inner bend.) The stimulus-point is set out to the edge of the solenoid so that the points of two such aesthesiometers may be brought together from a zero spatial separation. The brass guide-rod prevents the iron plunger from pivoting around, and the nut at the lower end of the guide-rod prevents the plunger from balling out altogether when the current is broken. While the plunger and appended weight are permitted a maximal excursion of more than half an inch, the plunger properly should not fall more than half a millimeter to the skin so that the skin will merely be pressed and not struck with a jarring impact. The small excursion is determined by the amount of rubber sponge which is transfixed on the upper portion of the guide-rod."

S-1302 Fig.86	Von Frey's Threshold Scale	-	-	\$ 52.00.
S-1303	Hair Aesthesiometer (Bujas)	-	-	\$ 7.00.
	The hair is contained in a glass tube which serves as handle. The end of the tube from which the hair protrudes is fitted with a small spring clamp which permits easy adjustment of the length of the hair to be used. Behind the hair, inside the tube, is a scale reading from 0-70 mm. The position of the end of the hair against this scale indicates the length of the part extended.			
S-1304 Fig.95	Two Point Aesthesiometer. (Ungraduated)	-	-	\$ 2.00.
S-1305 Fig.94	Spearman's Aesthesiometer (Graduated)	-	-	\$ 15.00.
S-1306 Fig.81	Tactual Perception Board	-	-	\$ 5.00.
S-1401 Fig.77	Elbow Movement Board	-	-	\$ 10.00.
S-1402	Discrimination Weights (Set of 21)	-	-	\$ 22.00.
S-1411 Fig.87	Size Weight Illusion	-	-	\$ 7.50.
S-1403 Fig.82	Temporal Finger Maze.	-	-	\$ 25.00.
	This device is offered through the courtesy of Roger G. Barker, Stanford University. For discussion see the American Journal of Psychology, October 1931, from which the following brief description is quoted. The cut, figure 82, is here used through the courtesy of this journal.			

" The blindfolded subject starts at point S, Fig.3 (see also the position of the subject's finger in Fig.2); this point is indicated to the subject by a small tack head. He proceeds toward the center

of the intersection, B, which is indicated by a round-headed upholstery tack. From the center of the intersection, the subject may proceed by one of the four radiating paths, 1, 2, 3, and 4 (Fig. 3); he has to find the correct one by motor exploration. This correct path is the only one not blocked by a wire post, 1/8 in. in diam. and 3/16 in. high. These posts may be removed at the will of the experimenter by manipulating the levers I, II, III, and IV. The levers extend beneath the board panel, and are hinged to it at the end near the subject (Fig. 2). Holes 3/16 in. in diam. are made in the center of each radiating path 1 1/2 in. from the center of the intersection. One of the levers extends below each of these holes and carries a metal post so placed that when the lever is against the panel (i.e. not pressed by E) the post will project above the trough of the path 3/16 in. The levers are held against the panel by silently acting springs. Thus, all paths are closed until E opens one by depressing a lever.

"E depresses the levers in accordance with the formula for the particular pattern S is learning. If the problem requires that path I be learned first, E depresses lever I and holds it down until S finds his way out over the peg hole. E then allows the spring to return the peg, and depresses the lever corresponding to the next correct choice in the pattern. It is only necessary for E to have before him the numbers indicating the order in which the levers are to be depressed.

"Certain advantages: (1) it is light and compact; (2) the pattern is easily and exactly described; (3) a very large number of maze patterns are immediately available, the same piece of apparatus serving for all the patterns; (4) successive choices in one direction does not carry S's hand far to one side predisposing to choices in the opposed direction; and (5) S may be allowed to see the paths with all pegs in place before he begins, he thus understands exactly the nature of the situation, but learns nothing of the details of the choices to be made."

P-1001 Fig. 83	Instructions Box. A test of ability to follow directions. (Diel)				\$ 85.00.
P-2001 Fig. 84	Complication Pendulum	-	-	-	\$ 85.00.
P-2002 Fig. 88	Complication Clock	-	-	-	\$ 65.00.
P-3001	Mirror Drawing Apparatus	-	-	-	\$ 32.00.
P-3011 Fig. 89.	Freeman's Puggle Box (Test of Mechanical Intelligence)	-	-	-	\$ 45.00.
P-3002 Fig. 91	Goddard's Form Board	-	-	-	\$ 6.50.
P-3003 Fig. 93	Test of Mechanical Intelligence	-	-	-	\$
P-3004 Fig. 96	Packing Blocks Test	-	-	-	\$ 7.50.
P-4001 Fig. 90	Vernier Chromoscope	-	-	-	\$ 27.00.
P-3007 Fig. 35-32 Fig. 35-33 (Same as Fig. 101.	Puzzle Board There are ten movable parts; when these are operated in the proper sequence, the disk becomes removable.	-	-	-	\$ 35.00.

P-4002 Modified Sanford Chronoscope.

\$ 30.00.

Fig.92

This improved form of the Vernier chronoscope is offered through the courtesy of Forrest L. Dimmick, Hobart College. For discussion see the American Journal of Psychology, July 1929, from which the following brief description is quoted. The cut, figure 95, is here used through the courtesy of this Journal.

"Everyone who has occasion to use the Sanford pendulum chronoscope is aware of certain disadvantages inherent in the instrument, not the least of which is the impermanent and variable nature of the mode of suspension of the pendulums. Students in the elementary laboratory are unable to adjust the threads accurately in a reasonable time and even after adjustment is attained it lasts for only a short time. It is customary to have the student check the accuracy of the pendulums at the beginning of every laboratory period, but in the writer's experience, the relative accuracy of the original adjustment does not last much beyond fifty reactions. To overcome this particular difficulty we have worked out the following modification in the Hobart Laboratory.

"We removed the brass arm which carries the pendulums and substituted a flat piece (A) of the same length and 1/2 in. by 3/16 in. Through this new arm we drilled two tapered holes (B) 1/4 in. to 1/2 in. in line with the two release buttons. At a distance of 5/16 in. on both sides of these holes we made shallow conical pits (C). At the top of each pendulum bob we drilled and tapped a 1/8 in. hole and into it fitted a 1/8 in. brass rod threaded at both ends. The upper end of the rod we passed through one of the holes in the supporting arm and into a cross arm (D) which carries two adjustable points (e). These points fit exactly into the depressions on either side of the hole. When the pendulum is adjusted to its proper length it swings freely and without friction on its point bearings. With this type of suspension, a pendulum will swing much longer than with thread suspension.

P-4003 Marietta Reaction Time Set

\$ 155.00.

Fig.97

This outfit consists of the following:

Fig.98

1. A Marietta Chronoscope (Synchronous Motor Type)
2. Stimulus unit: a) Finger key and connections wired for simple, discrimination and choice reaction experiments, b) Visual stimulus: white, red and green lights, c) Auditory stimulus: buzzer type, d) Visual verbal stimulus: simple exposure unit with set of association test words cards (Kent Rosanoff list), e) Lip key for verbal stimulus.
3. Reaction unit: a) Finger keys for simple and choice reactions, b) Lip key for verbal reaction.
4. Complete equipment mounted on boards ready for immediate use without wiring or other preparations.
5. Lamps, switches and all necessary parts complete, (but without battery). (Six volt storage battery is recommended).
Also furnished without lip keys or word exposure window, @ \$115.00.

Description of Operation:

- Closing switch No. 8 prepares circuit for chronoscope and right hand reaction key.
Closing switch No. 7 prepares circuit for chronoscope and left hand reaction key.
Closing switch No. 6 prepares circuit for light stimulus.

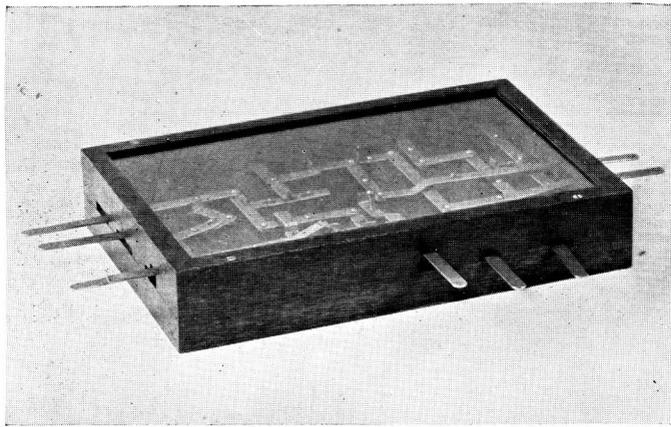


Fig. 89

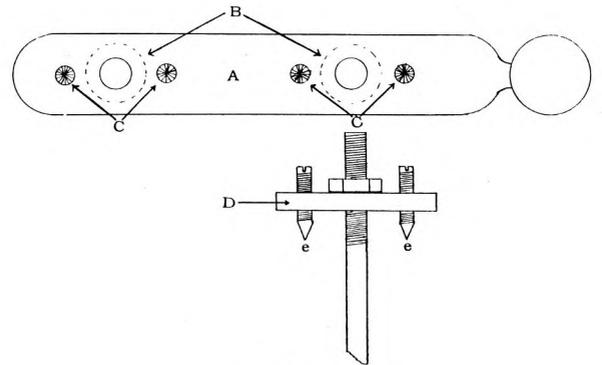


Fig. 92

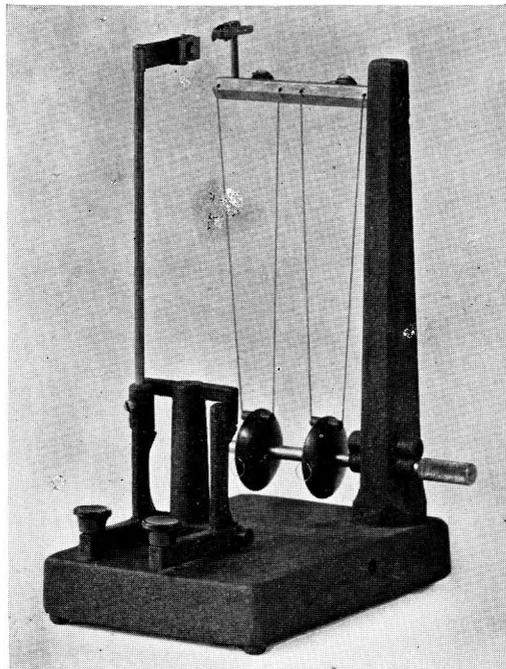


Fig. 90

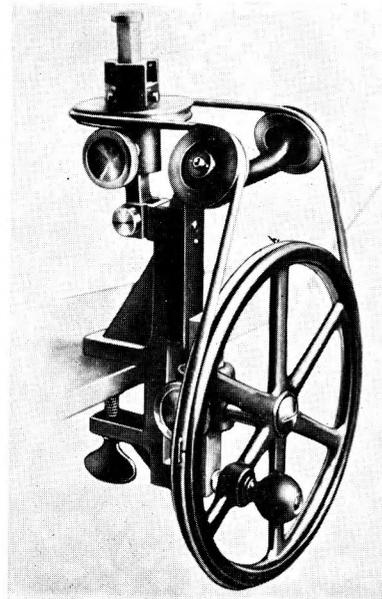


Fig. 93

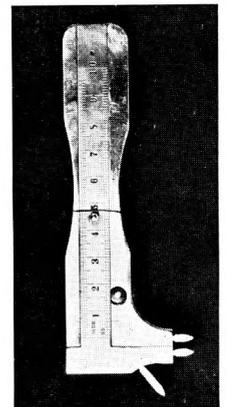


Fig. 94

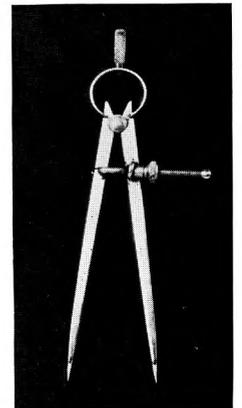


Fig. 95

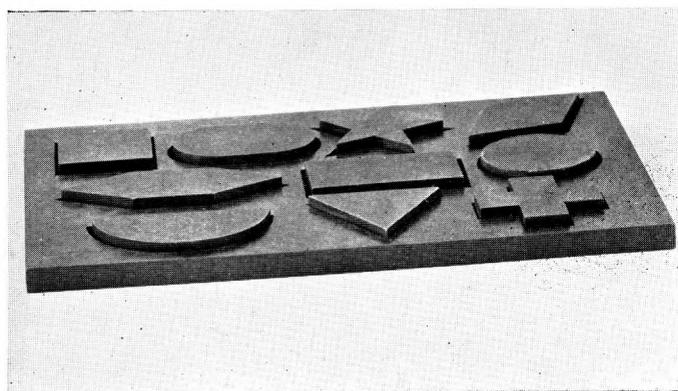


Fig. 91

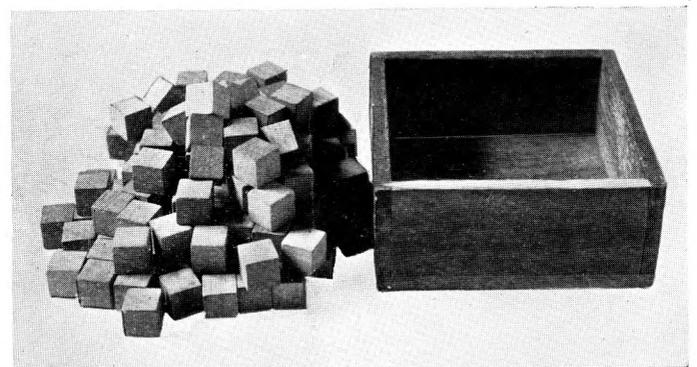


Fig. 96

Closing switch No. 5 prepares circuit for auditory stimulus (buzzer)
 Closing switch No. 4 prepares circuit for shutter.
 Closing switch No. 2 prepares circuit for response lip key.

In all of the above cases the stimulus is applied by the experimenter's finger key.

Closing switch No. 1 prepares circuit for stimulus by experimenter's lip key, and response by subject's lip key.

For example, if experiment is on reaction time for discrimination and choice, and if subject is instructed to respond to red light with right hand key, and to green light with left hand key, close switch No. 6, set light unit at red, close switch No. 8, and depress stimulus key. Or set light at green, close switch No. 7, and depress stimulus key.

In such cases if wrong reactions are made the trouble of resetting the chronoscope to zero is avoided.

OTHER EXAMPLES:

For discrimination reaction using light and buzzer as stimuli and right hand key for response, close switch No. 8, instruct subject to press right hand key when light is flashed, but refrain from reaction when buzzer is sounded, then close switch No. 6 or No. 5 in chance order, and apply stimulus by depressing finger key. Here again wrong reactions are indicated by a click of subject's key, but trouble of resetting the chronoscope for such wrong reactions is avoided by having only appropriate switch closed.

If spoken response to spoken stimulus is desired close switch No. 1 and use both lip keys.

If spoken response to visual-verbal stimulus is desired close switch No. 2, also No. 4, and apply stimulus by pressing finger key.

P-4004

As noted in Section / describing the chronoscope both stimulus and response are secured by closing a circuit. Set pointer of small disk at zero on time disk, instruct subject to keep key depressed for a few moments after reaction. Experimenter keeps his own key depressed until after reaction, releasing it before subject releases his. Thus the pointer disk released by the magnets then rests on the time disk and reaction time is measured by displacement of the one on the other. It is better to stop the chronoscope before the subject's key is released.

The chronoscope is driven by a synchronous motor which gives one revolution per second with 60 cycle A.C.

P-3005	Mirror Drawing Apparatus (Freeman)	-	-	\$ 32.00.
	This consists of wooden base about 24x18 inches supporting a reversing writing lever and mirrors. The lever is so constructed as to produce a double reversal of the hand movements, both right-left, and forward-backward. The mirror is freely adjustable in the horizontal plane, being hinged or pivoted at three points. The lever and hand holding control stylus are concealed by black curtains on a rectangular frame supported by four uprights. For discussion see Freeman's Experimental Education..			
P-3105	Pintner-Paterson Performance Test	-	-	\$ 54.50.
Fig.99	(For details - see following page.)			
P-3106	Test of Mechanical Ability	-	-	\$ 45.00.
Fig.100				
P-3107	Puzzle Board (Test of Mechanical Ability)	-	-	\$ 35.00.
Fig.101				

(Pintner-Paterson Performance Test)
(Short Scale)

1.	Mare and Foal	-	-	\$ 4.50.
2.	Seguin Form Board	-	-	\$ 6.50.
3.	Paterson Five Figure Form Board	-	-	\$ 7.00.
4.	Pintner Two Figure Form Board	-	-	\$ 4.50.
5.	Casuists Form Board	-	-	\$ 7.00.
6.	Mannikin	-	-	\$ 4.00.
7.	Feature Profile Form Board	-	-	\$ 3.50.
8.	Ship Form Board	-	-	\$ 4.50.
9.	Healy Pictorial Completion No. 1.	-	-	\$10.00.
10.	Cube Imitation Test	-	-	\$ 3.00.

P-3208 Multiple Choice Apparatus - - \$ 125.00.
Fig.103

P-3209 Multiple Choice Apparatus - - \$ 75.00.
Fig.104

This device is offered through the courtesy of E. G. Weaver, Princeton University, and K. E. Zener, Duke University. For discussion see the American Journal of Psychology, October 1929, from which the following brief description is quoted. The cut, Fig. 104, is here used through the courtesy of this Journal.

"The apparatus is shown, from the E's side, in Fig.2. S sits behind the apparatus, holding in one hand the brass electrode (t). His view of E's manipulations is obscured by the board (A). Before S, in the board (D), are twelve 1-in. holes, any number of which may be exposed at one time. The two wooden sliders (C) are provided for varying the number of holes exposed. A finger extended through one of the holes will operate a key, which is simply a brass strip (n) mounted above a screw-head (o) so as to touch it when depressed. Pressing a key completes an electric circuit and gives S a shock in the operating finger, unless the response is the 'correct' one, in which case a short-circuit of the current will have been provided by a setting of the lever (s). This lever may be set so as to make contact with any one of twelve screw-heads (n), and thus short-circuit any one of the keys.

"An understanding of the electrical connections will be facilitated by an examination of the wiring diagram in Fig. 3. Most of the wiring runs beneath the board (B), and is concealed from view. From (q), which connects with one side of the electrical supply, a wire runs to each of the screws (o) with which the keys make contact. From (p), which connects with the other side of the electrical supply, one wire runs to the electrode (t), and another to the screw (k) on which the lever (s) is pivoted. The screws (n) that are arranged in the arc of the lever's swing are connected with a corresponding key. When the lever is turned to a given screw, it is plain that pressing the key to which it corresponds will give no shock, since the current will take the path of lower resistance. Pressing any other key, on the other hand, will lead to punishment in the form of shock."

P-3010 Minnesota Test of Mechanical Ability.
Fig.102
Fig.105

The Minnesota Tests of Mechanical Ability are the outcome of a research project organized by the Department of Psychology, University of Minnesota, in 1923. The complete report of this project has been published in book form by the University of Minnesota Press. The following quotation from the Foreword of this volume, by Robert M. Yerkes, One-time Chairman, Committee on Scientific Problems of Human Migrations. National Research Council suggests the unique significance of this work: - "The University of Minnesota study of mechanical abilities originated in a program of research which was formulated and promoted by a Committee of the National Research Council." "It is difficult for me to write calmly and objectively of this report, so stirred am I by its contribution of fact, method, and insight, and its promise of developments which should significantly improve educational, vocational, and industrial procedures."

1. Minnesota Paper Form Board
Series A, per 100 - - \$ 3.00.
Series B, per 100 - - \$ 3.00.

2. Minnesota Spatial Relations Test			
Boards A and B	--	\$ 17.00	
Boards C and D	--	17.00	\$ 34.00.
3. Minnesota Assembly Test			
Long Form:			
Box A	--	\$ 8.50	
Box B	--	8.50	
Box C	--	12.00	\$ 29.00.
Short Form:			
Box 1	--	\$ 8.50	
Box 2	--	8.50	\$ 17.00.
Assembly Test Score Sheet, per 100			\$ 1.00.
4. Minnesota Interest Analysis Test, per 100			\$ 2.50.
5. Packing Blocks Test	--	--	\$ 7.50.
6. Card Sorting Test	--	--	\$ 6.50.
7. "Minnesota Mechanical Ability Tests"	--	--	\$ 5.00.
(Complete Information and Instructions).			

P-4004 Marietta Chronoscope (Spring Motor Drive) -- \$ 45.00.
 Fig.106 This instrument was originally designed to meet the need

- for an inexpensive but reliable chronoscope for general student use in the psychological laboratory.
1. Driven by spring motor the speed of which except at very high and very low spring tension, has a variability of about one-tenth of one per cent.
 2. The rotation rate of time disk is regulated by means of stroboscopic pattern and pulsating light. A small lamp may be used with either 50 or 100 d.v. (a tuning fork). The disk pattern may also be used with 60 cycle A.C.light. (Neon lamp \$1.00 extra.)
 3. When so ordered, the chronoscope is provided with a small vibrating reed timed to 100 d.v. per second, by means of which the rotation rate of chronoscope can be regulated almost as easily and accurately as by means of the pulsating light. (\$2.00 extra.)
 4. The stroboscopic disk carries a smaller disk, divided into hundredths, and this in turn carries a small pointer. The stimulus circuit activates an inner pair of magnets which arrest the pointer. The reaction circuit activates an outer pair of magnets, which arrest the time disk. The displacement indicates the time interval. The scale reads at a glance in hundredths of a second.

P-4005 The New Marietta Chronoscope. -- \$ 55.00.

Fig.35-27 This is driven by a synchronous motor or an electric governor motor. It is improved in detail, quieter in operation, and more accurate and convenient.
 (If A.C. is not available, designate D.C. voltage.
 This motor operates at a constant speed when set for a specified voltage, within voltage fluctuations of about five percent.)

P-4006 Interval Apparatus (Incline Plane Timing Device) -- \$ 92.00.

Fig.35-28 The inclined runway for a pair of steel balls gives, at various angles and for various positions of the stop-keys, a range of intervals from five seconds to less than one-tenth second. For the longer intervals, one ball is used, at small elevation, for the short intervals, a greater elevation, and the two balls. In the former case, the key

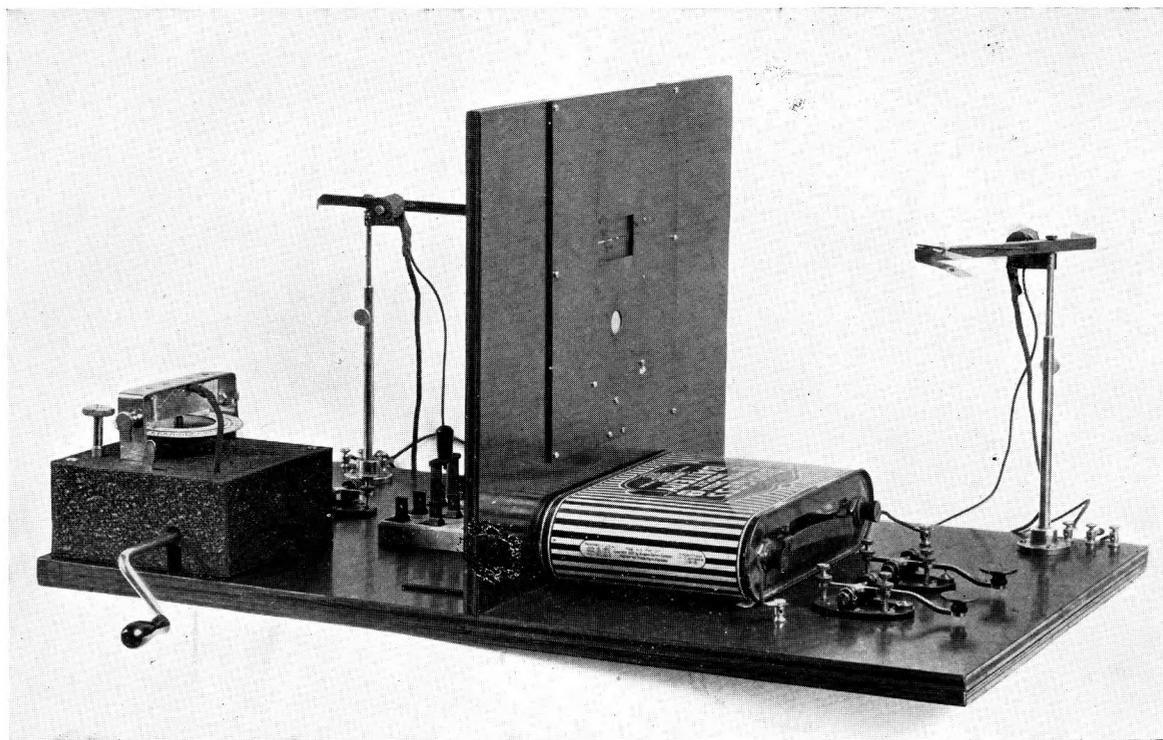


Fig. 97

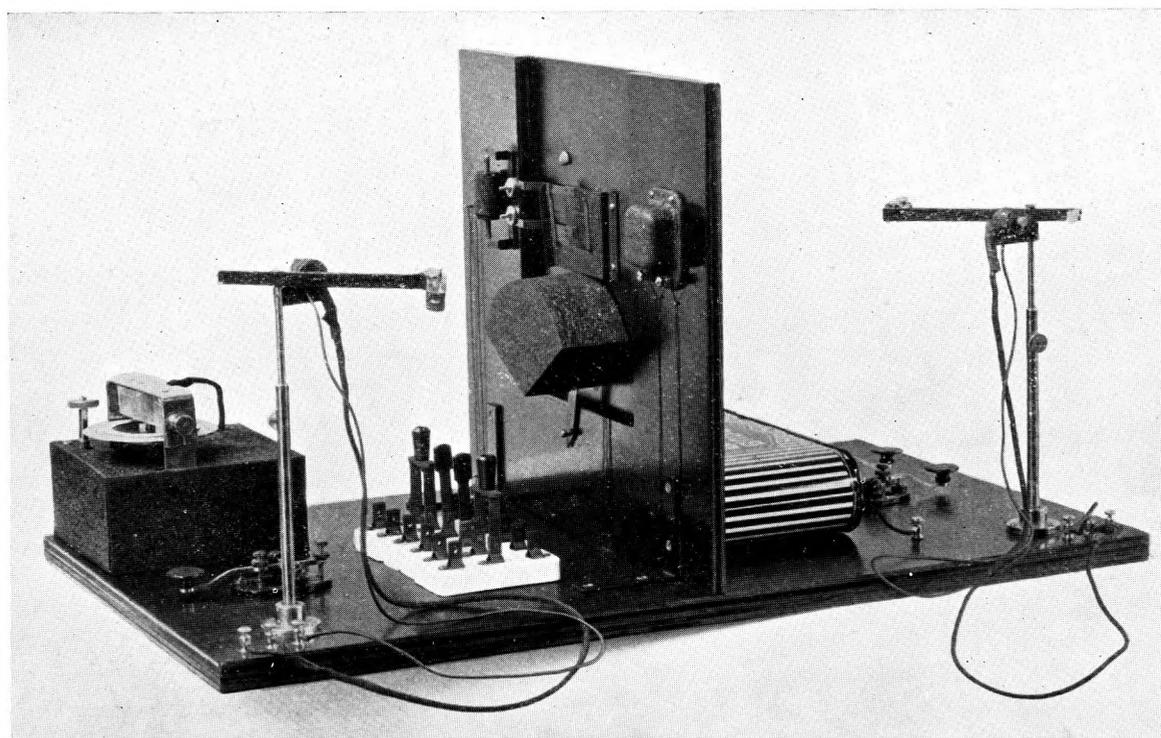


Fig. 98

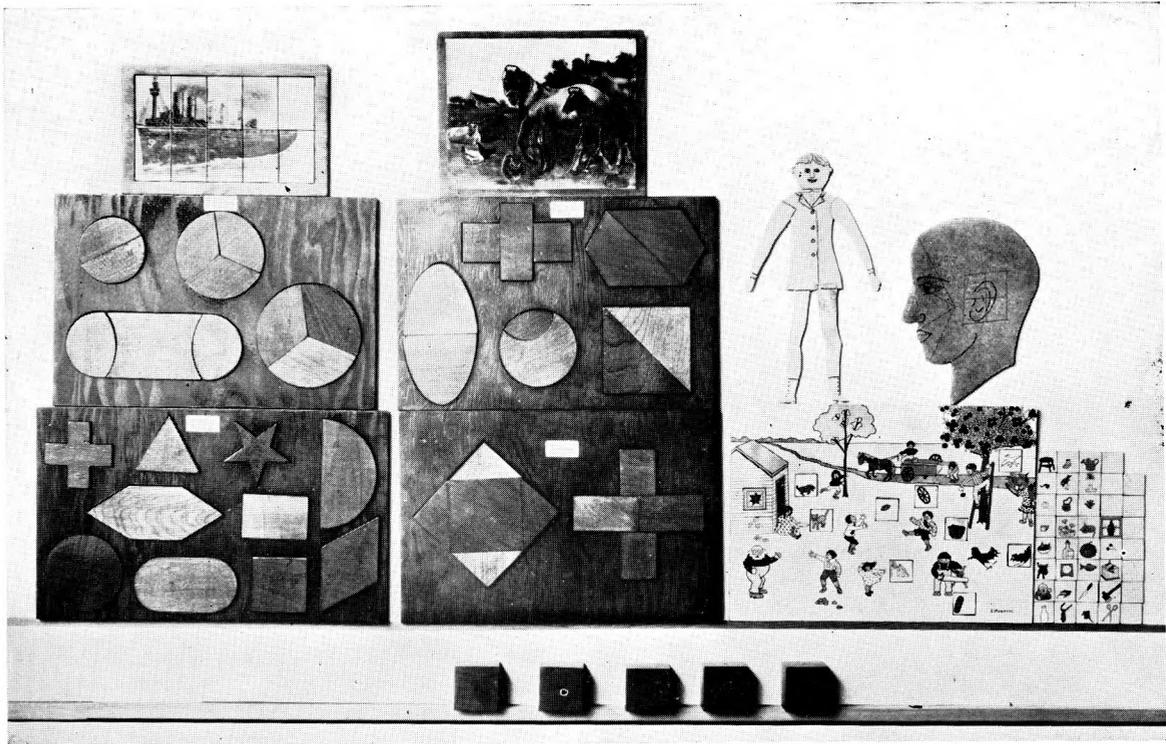


Fig. 99

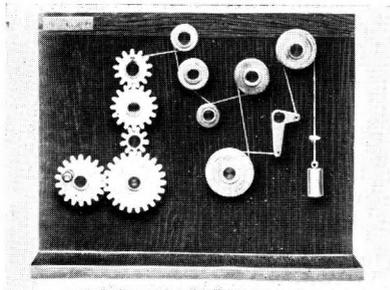


Fig. 100

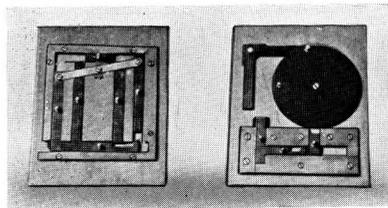


Fig. 101

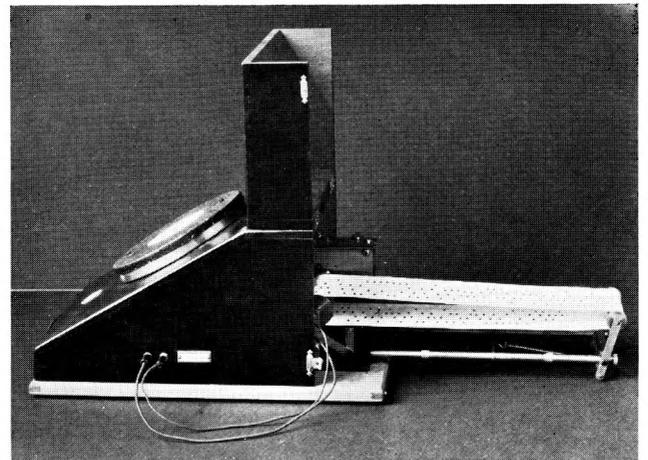


Fig. 103

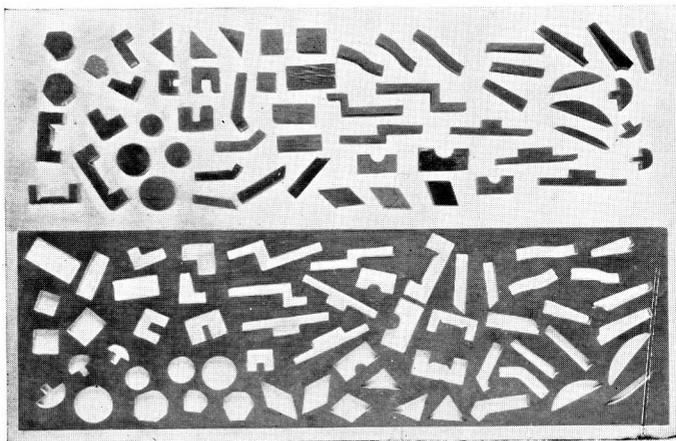


Fig. 102

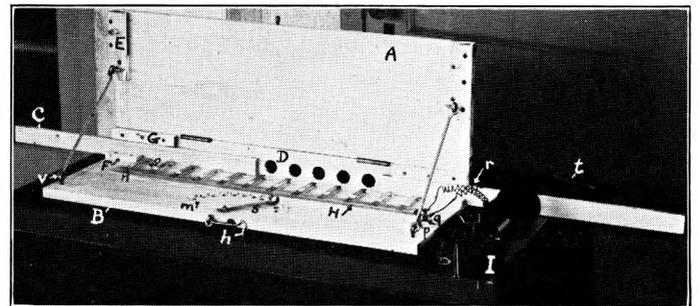


Fig. 104

which releases the ball initiates the interval, and the stop breaks the circuit. In the latter case, the stop for one ball initiates the interval and the stop for the second ball breaks the circuit. The device is empirically calibrated.

P-3011	Automatograph.	-	-	-	\$ 18.00.
Fig.107	This automatograph consists of two plate glass units, separated by ball bearings. The upper glass thus moves very freely on the lower glass, and records movements of the arm resting on the upper glass by means of a stylus which passes through the upper glass and makes a tracing on sheet of paper on lower glass.				
P-3012	Steadiness Test	-	-	-	\$ 8.50.
Fig.108					
P-3013	Tapping Test	-	-	-	\$ 6.50.
Fig.109					
P-3014	Precision Board	-	-	-	\$ 7.50.
Fig.110					
P-3015	Steadiness Test.	-	-	-	\$ 35.00.
Fig.111	The two hands, extended at arms length, grasp two handles. One handle supports a dial mechanism, to the other is attached a cord which runs over to the dial mechanism. The task is to hold the indicator on a definite point. The slightest movements of the hands are registered by fluctuations of the pointer.				
P-3016	Tremograph.	-	-	-	\$ 11.00.
Fig.111	This instrument is intended for a graphic recording of involuntary arm movements. The diaphragm of the tambour supports a small upright bar, on which is placed a small weight. As the tambour is held by the handle in the subjects hand, movements of the hand are registered as air fluctuations on account of the inertia of the weight resting on the diaphragm.				
P-3017	Galton Bar.	-	-	-	\$ 75.00.
Fig.35-21	For the adjustment of juxtaposed, visual areas, to secure judgment of equality. (See Titchener, Experimental Psychology, Vol. 2, Students Manual, page , and Instructors Manual, page .)				
P-3018	Vertical Test.	-	-	-	\$ 75.00.
Fig.35-22	Test for Judgment of Vertical. The cut, figure 35-22, shows the experimenter's side of the apparatus. The subject faces the semi-circular window, in which a vertical, radial rod appears. The position of this rod is controlled by a knob on the subject's experimenter's side of the device.				
P-3019	Angle Test.	-	-	-	\$ 55.00.
Fig.35-23	Test for Judgment of Angle. Similar in general character to P-3018. The radial arms are adjusted by the subject by means of the control knob to secure division of the circular area into required parts, half; one-third; two-thirds; one-fourth; three-fourths; etc.				

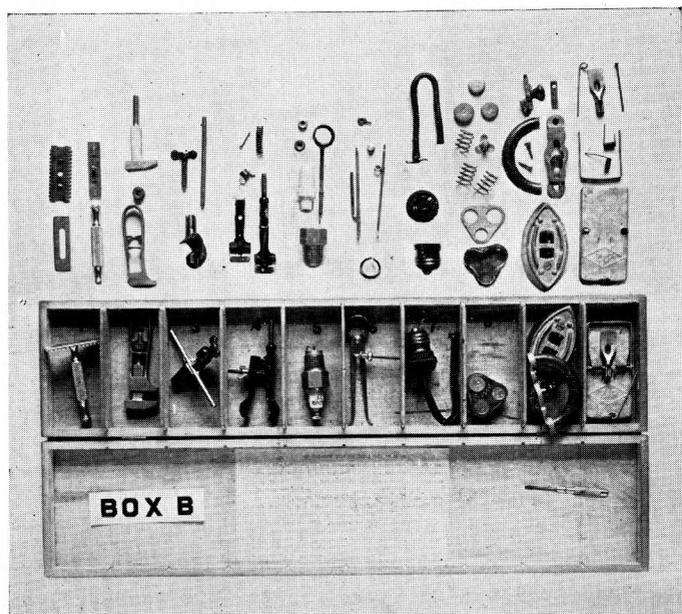


Fig. 105

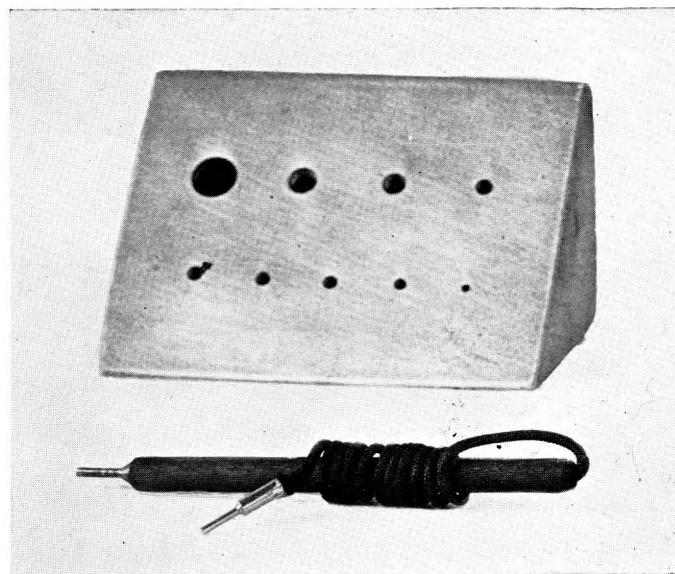


Fig. 108

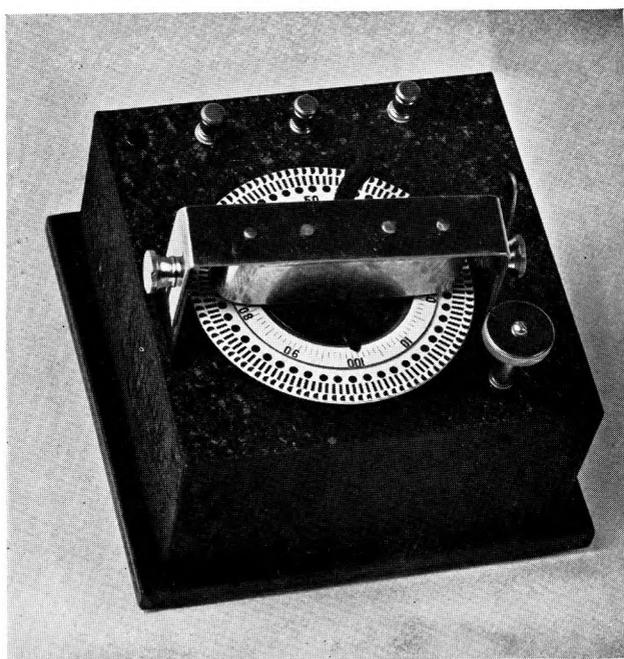


Fig. 106

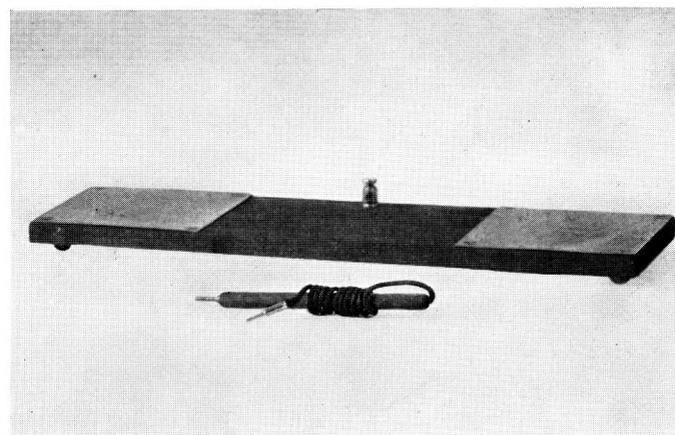


Fig. 109

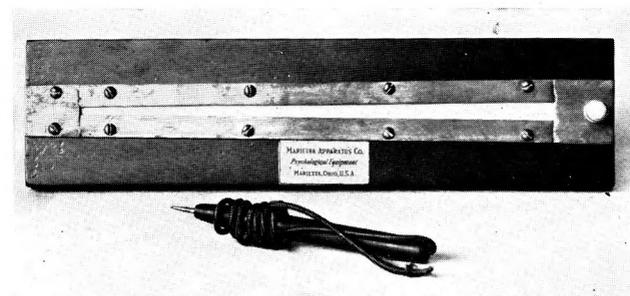


Fig. 110

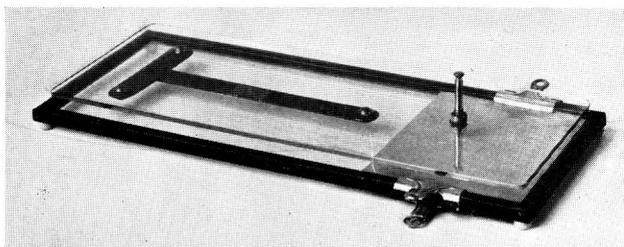


Fig. 107

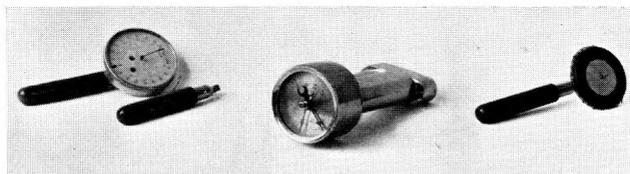


Fig. 111

P-3020	Two-hand Coordination Pursuit Meter.				
Fig.35-24	The path to be followed is marked on the moving paper roll, shown in the opening. The pointer is kept as nearly as possible on the path by means of the crank shown at the right while the paper is kept moving by the rotation of the crank shown in front. The score may be stated as the product of the fraction: allowed time as numerator, and consumed time denominator, multiplied by the fraction: time "on" the path as numerator, consumed time as denominator. (For a suitable recording device, see P-5003, figure 35-31).				
P-3101	Legs Steadiness Test	-	-	-	\$ 95.00.
Fig.35-25	Similar in general principle to the "volometer" (See F.N. Freeman, Mental Tests, page 204), but arranged so as to record success in terms of a curve indicating for successive intervals the ratio of correct to incorrect position. The recording device is similar to that shown in P-5003, figure 35-31, but has a moving series of receptacles, the successive units receiving the correct drip for successive intervals. (Recording device not included in price)				
P-3102	Back and Legs Ergograph	-	-	-	\$ 112.00.
Fig.35-26					
P-3021	Two Hand Coordination Test	-	-	-	\$ 27.00.
Fig.114)					
P-3022	Vertical Radius Test	-	-	-	\$ 32.00.
Fig.118					
P-2023	Horizontal Bisecting Test	-	-	-	\$ 40.00.
Fig.115					
P-4007	Reemer Sound Key	-	-	-	\$ 55.00.
Fig.112					
P-4008	Catell Sound Key	-	-	-	\$ 48.00.
Fig.117					
P-4009	Five Finger Key	-	-	-	\$ 20.00.
Fig.113					
P-4010	Müller-Pilzecker Lip Key	-	-	-	\$ 30.00.
Fig.116					
P-4011	Telegraph Sounder	-	-	-	\$ 3.00.
Fig.119					
P-4012	Telegraph Key	-	-	-	\$ 2.75.
Fig.120					
P-5001	Attention Apparatus.	-	-	-	\$ 210.00.
Fig.35-29	This apparatus consists of a drum driven, at adjustable rates, by constant speed motor. There are ten windows and on the drum ten rows of symbols. A specified set of symbols appear in chance order at various windows. When any symbol of the set appears at any window, the subject should press the adjacent key. The device is provided with three electro-magnetic counters, in which the total number of opportunities,				

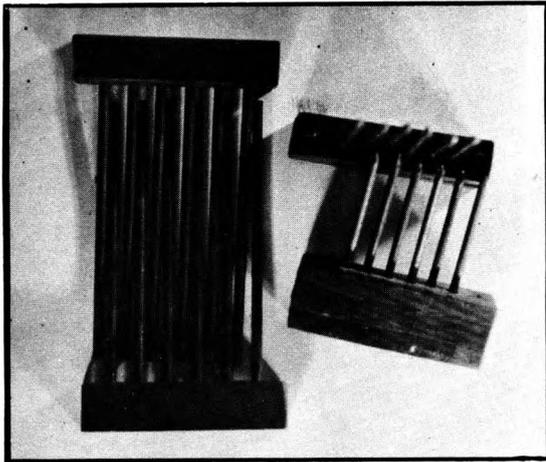


FIG. 35-19

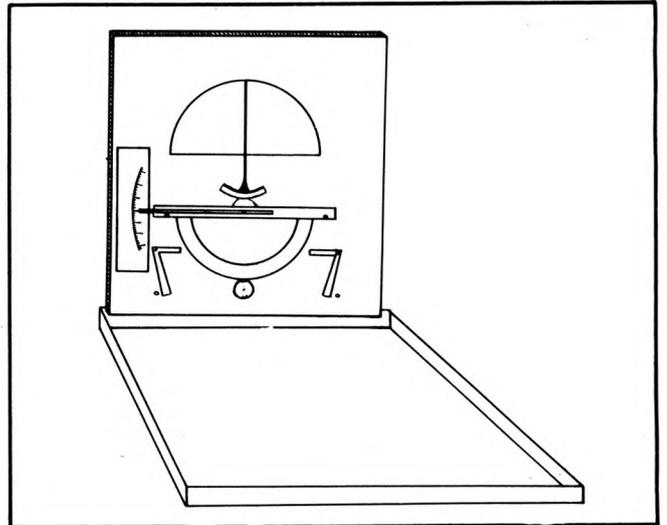


FIG. 35-22

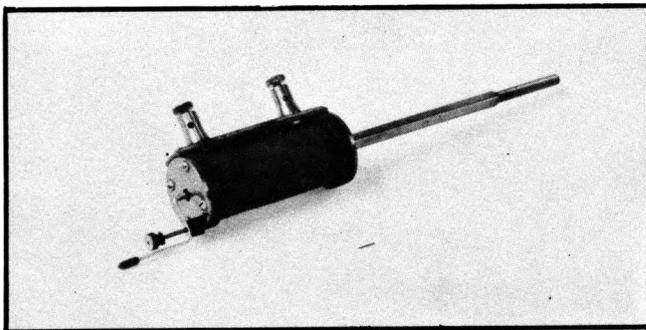


FIG. 35-20

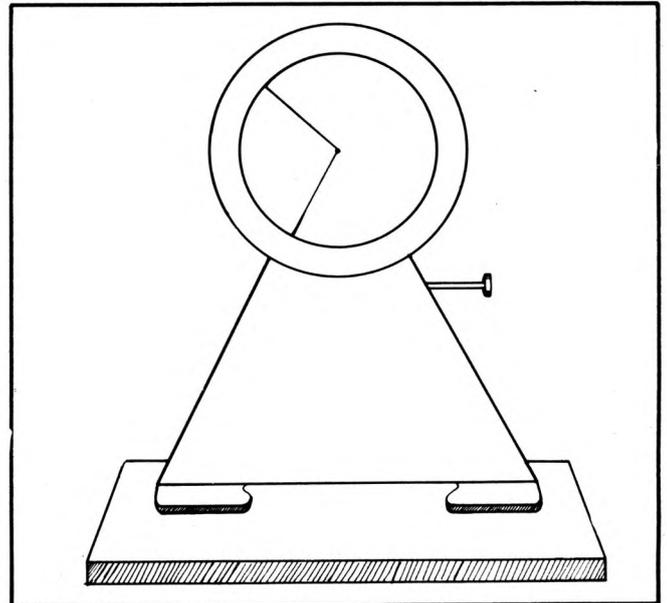


FIG. 35-23

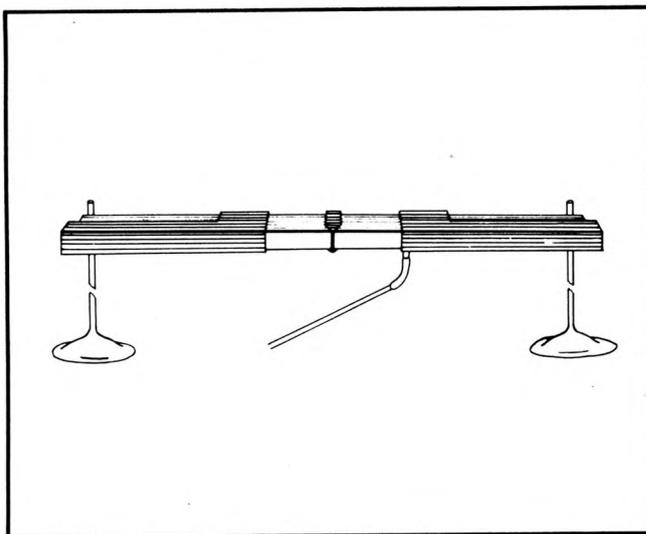


FIG. 35-21

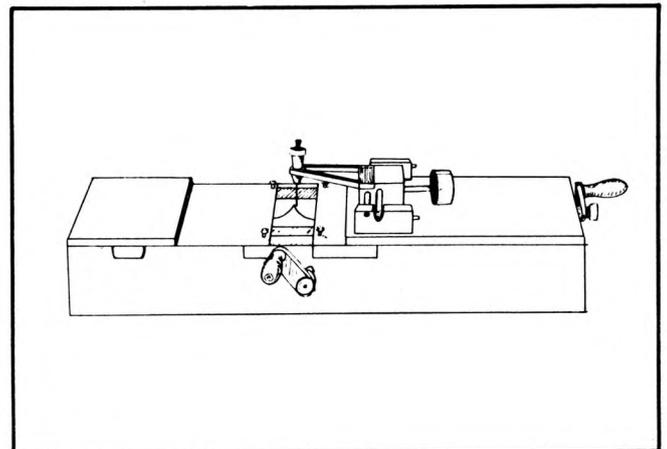


FIG. 35-24

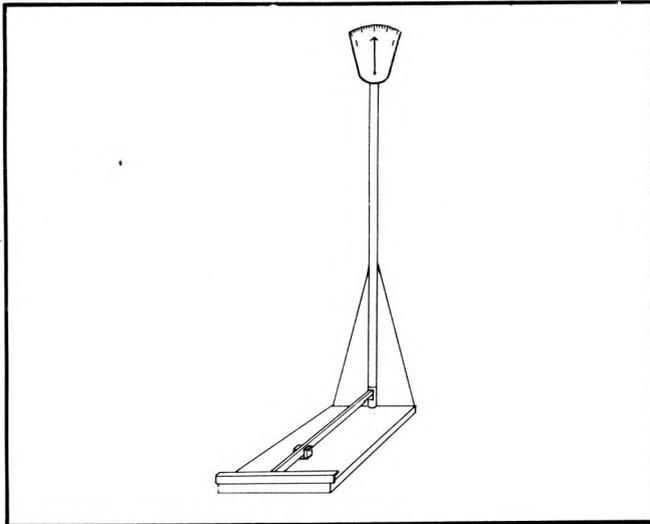


FIG. 35-25

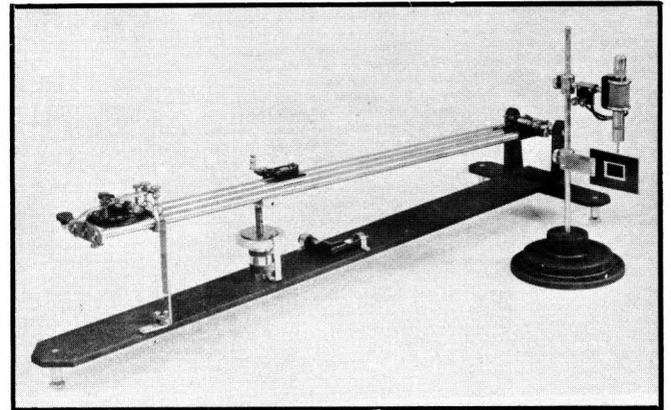


FIG. 35-28

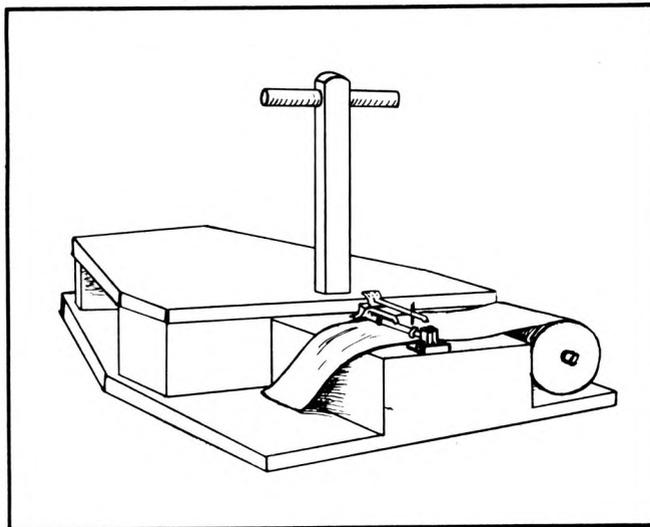


FIG. 35-26

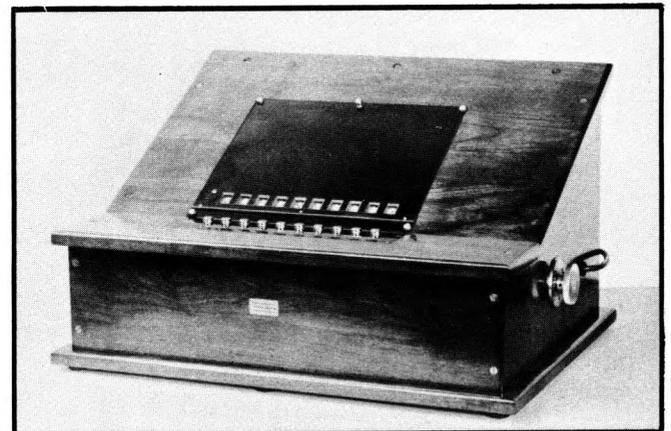


FIG. 35-29

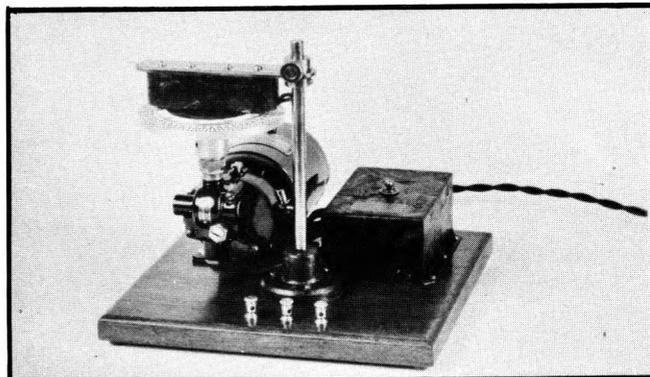


FIG. 35-27



FIG. 35-30

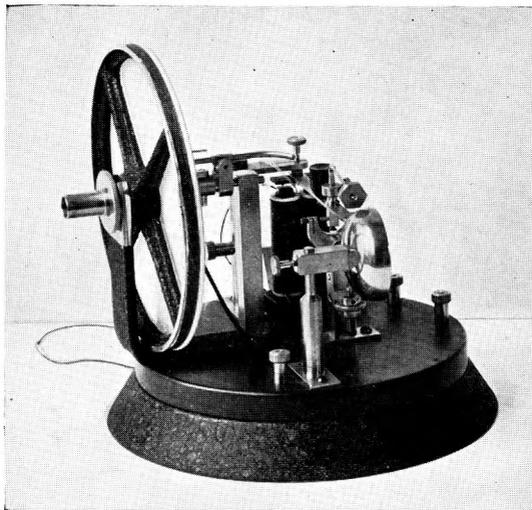


Fig. 112

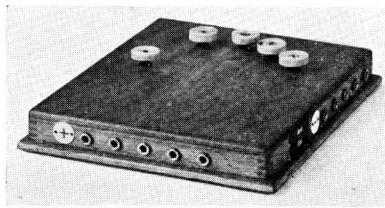


Fig. 113

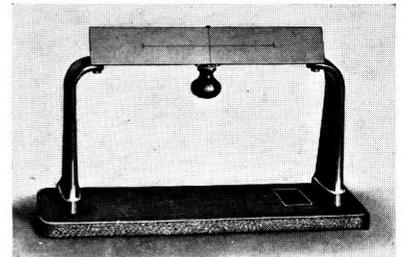


Fig. 115

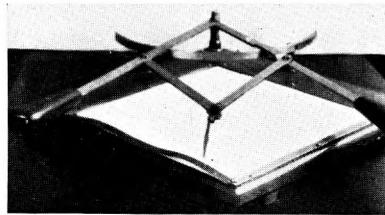


Fig. 114

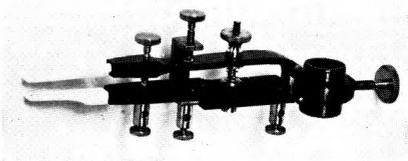


Fig. 116

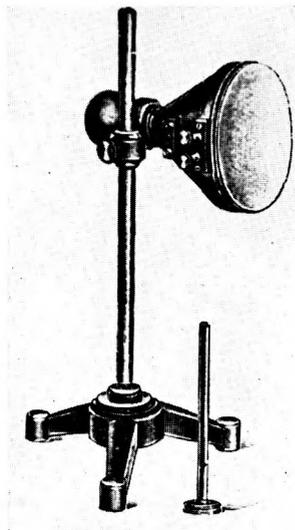


Fig. 117

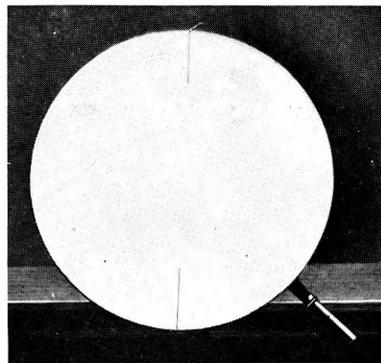


Fig. 118

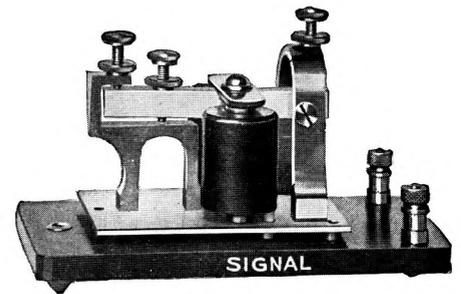


Fig. 119

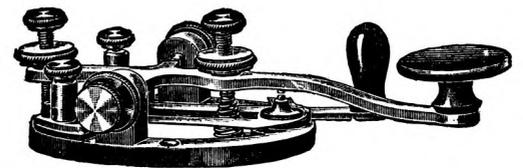


Fig. 120

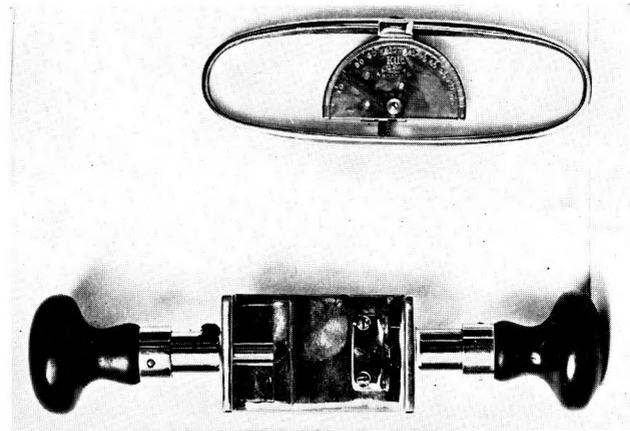


Fig. 121

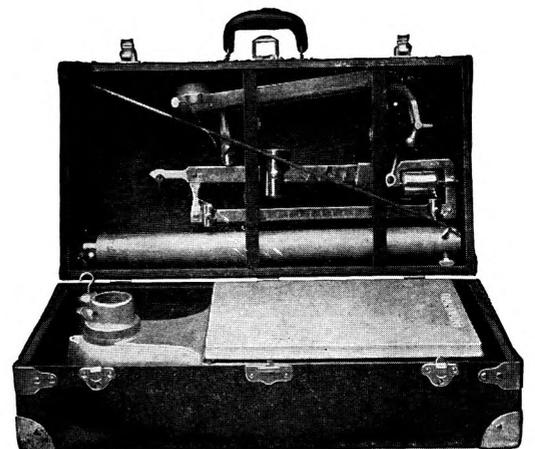


Fig. 122

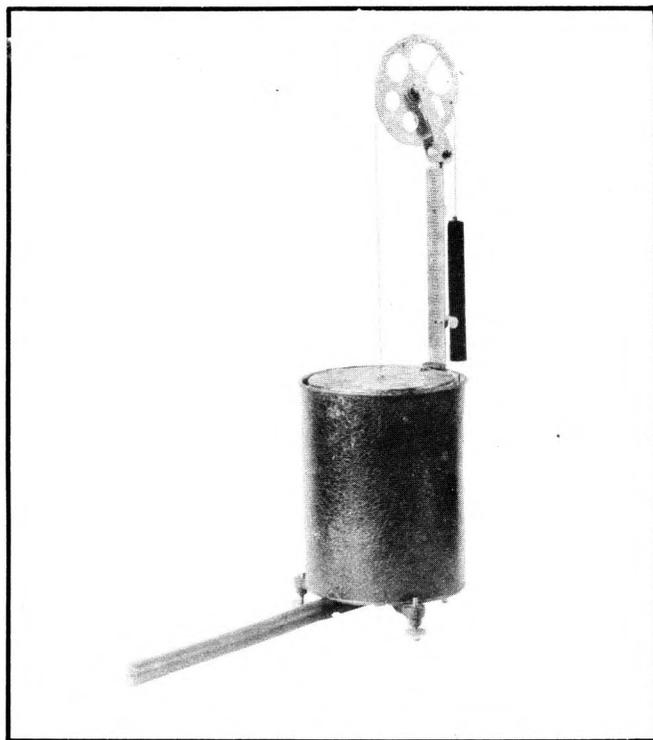


FIG. 35-36

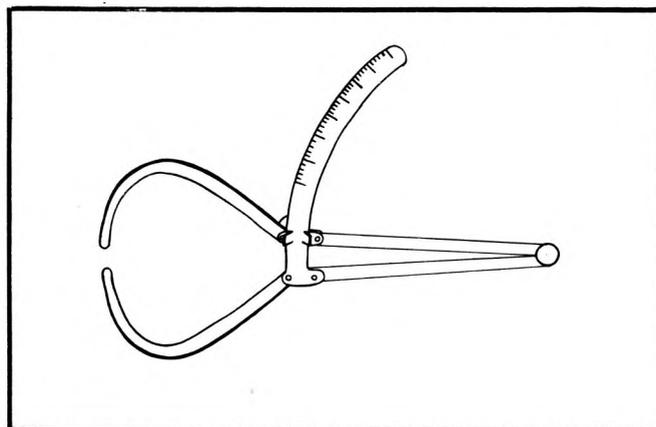


FIG. 35-39

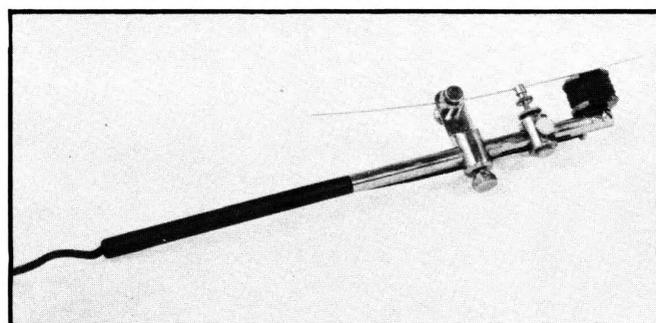


FIG. 35-40

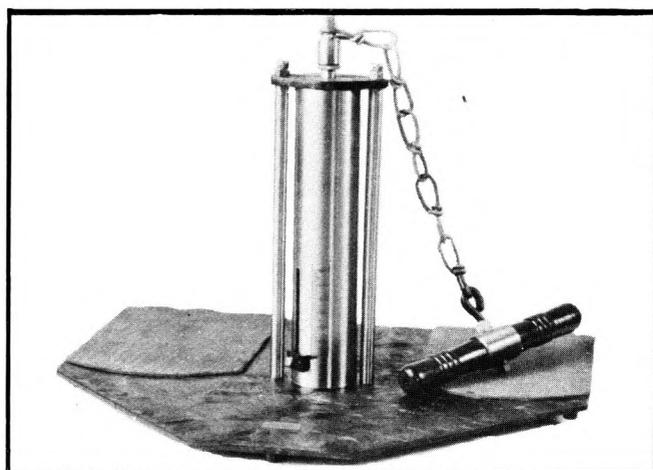


FIG. 35-37

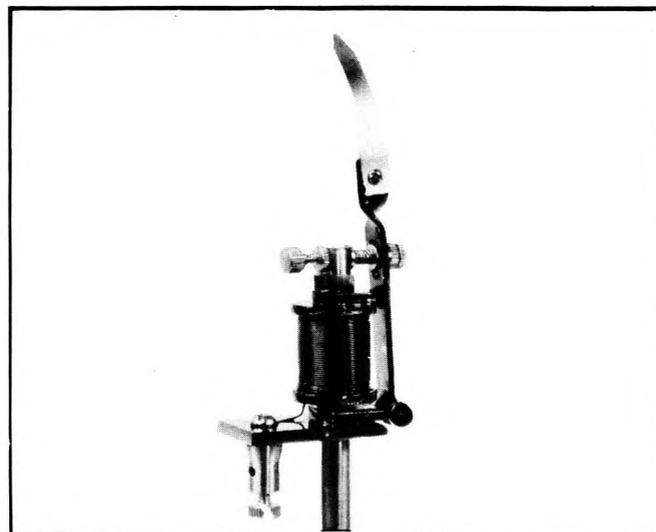


FIG. 35-41

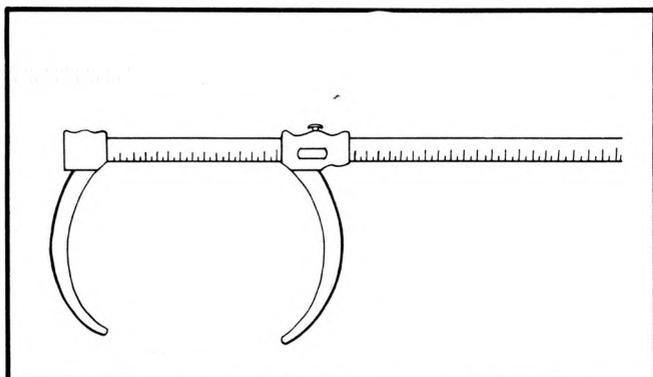


FIG. 35-38

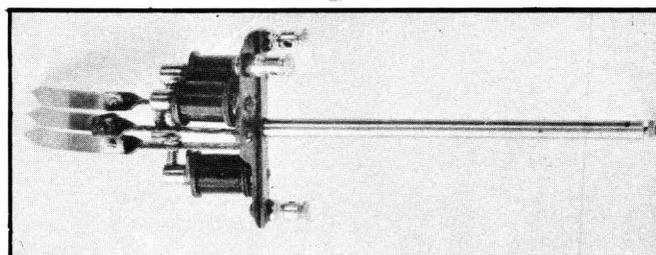


FIG. 35-42

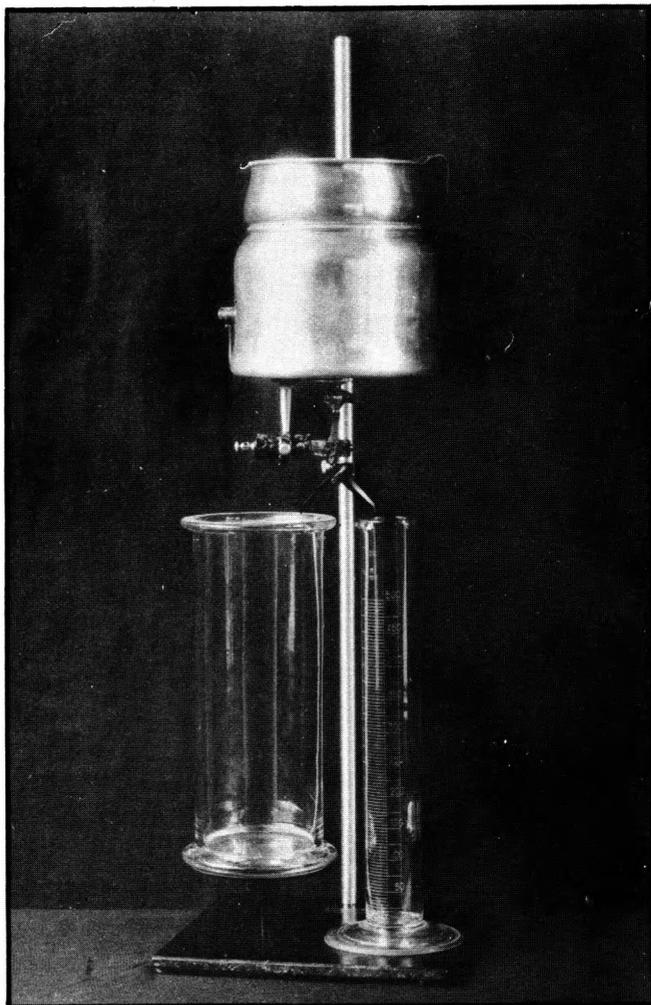


FIG. 35-31

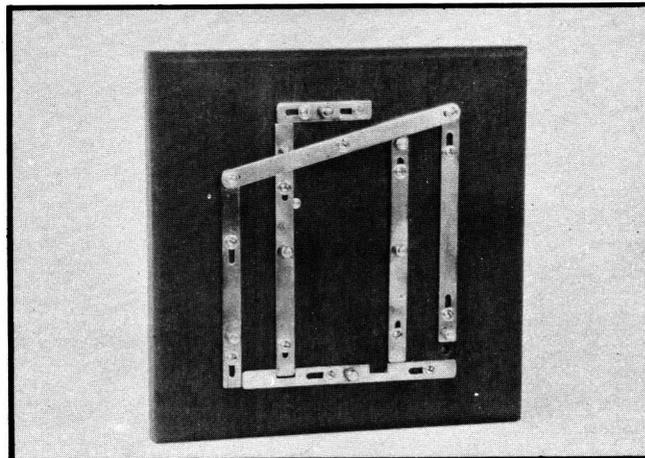


FIG. 35-33

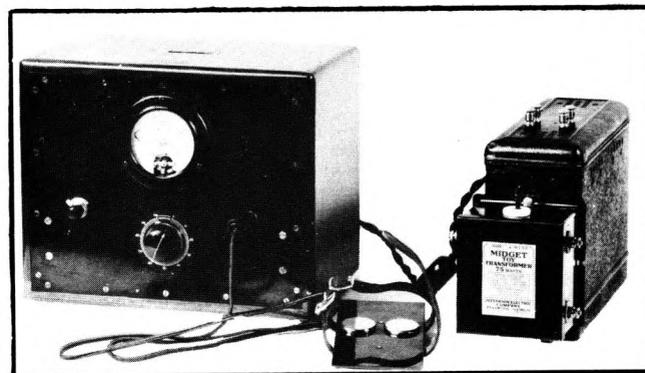


FIG. 35-34

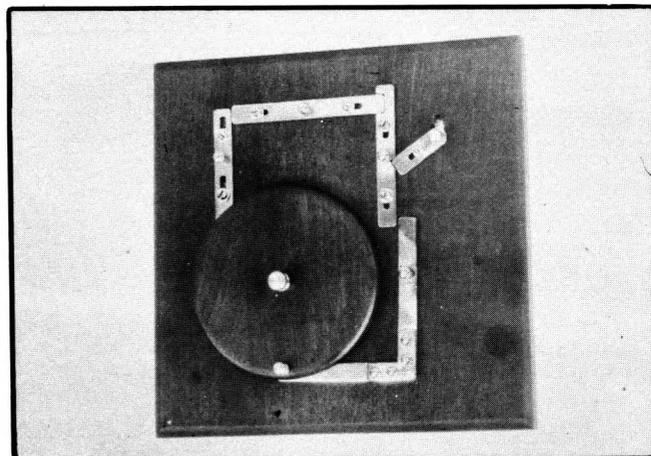


FIG. 35-32



FIG. 35-35

P-6006	Cardiograph (Jacquet).	-	-	-	\$ 30.00.
Fig.124 (right)	Consists of an outer lead ring, leather covered, on which the capsule is adjustably supported. The arrangement is very simple and practical. Equipped with straps for attachment.				
P-6007	Sphygmograph (Lehmann).	-	-	-	\$ 27.00.
Fig.124 (left)	A pair of parallel supporting rods, about 2 inches long, and about $\frac{3}{4}$ inch apart, are attached at one end of a curved metal frame which carries adjustably the tube of an air capsule (3 inches diameter). The diaphragm of the capsule bears a thin disk of aluminum, and this supports a light upright post (non-metallic.) The end of this post rests upon the pulse surface between the supporting parallel rods. The whole is held in position by a leather strap attached to the supporting rods.				
P-6008	Sphygmograph.	-	-	-	\$ 28.00.
Fig.125 (left)	Similar in construction to P-6007, except that the post of the air capsule rests, not directly on the pulse, but on the back of a flat hinged spring which holds a projecting knob against the pulse. The tension of the spring against the pulse can be regulated by means of an eccentric. Also the capsule can be swung to one side, on its supporting frame, during the adjustment of the instrument to the arm.				
P-6009	Pneumograph (Marey).	-	-	-	\$ 30.00.
Fig 125 (right) Fig.130	The two parallel supporting bars, about 3 inches apart, rest upon the chest. One end of the strap is attached to the bridge piece, and the other end is attached to the long end of a lever pivoted on the bridge piece just above one of the supporting bars. The short end of this lever activates a cross bar which in turn acts on the projecting post of the air capsule. The lever's long arm is drawn inward by a coil spring. After the straps are adjusted, fine adjustment is secured by means of a slotted attachment which regulates the positions of capsule post, cross bar and lever, with relation to each other.				
P-6010	Pneumograph (Gutzmann).	-	-	-	\$ 6.50.
Fig.127 (bottom)	A simple device consisting of a 12 inch length of rubber tubing, with straps and end pieces, one of which bears the nipple for tube connecting with tambour.				
P-6011	Pneumograph.	-	-	-	\$ 12.00.
Fig.128	This type consists of flexible rubber tube distended by a coiled spring, with metal end pieces, one of which is closed and the other of which has a nipple to which is attached the tube connecting the pneumograph with the tambour. The tube is held in position around the chest or abdomen by a light chain and hook.				
P-6012	Electric Pneumograph (Cason)	-	-	-	\$ 25.00.
P-7001	Wet Spirometer	-	-	-	\$ 32.00.
Fig.35-36					
P-7002	Hand Dynamometer.	-	-	-	\$ 15.00.
Fig. 121	Push & Pull Holders	-	-	-	\$ 15.00.
Fig. 129	" " "	-	-	-	\$ 15.00.

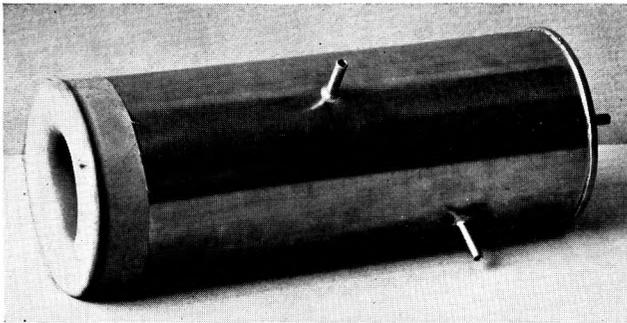


Fig. 123

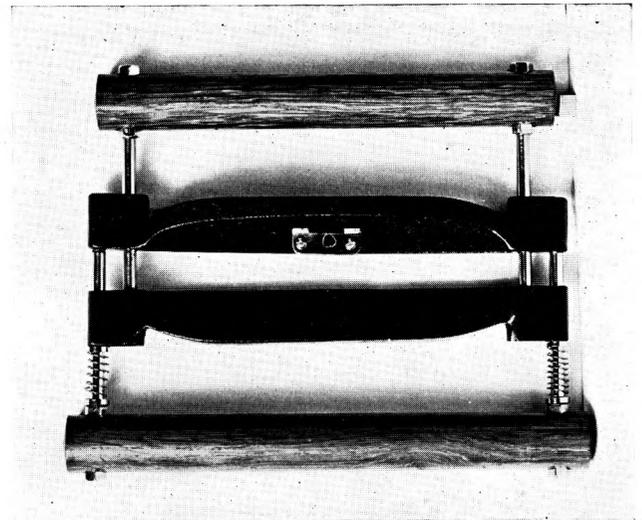


Fig. 129

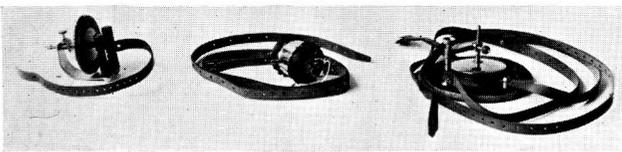


Fig. 124

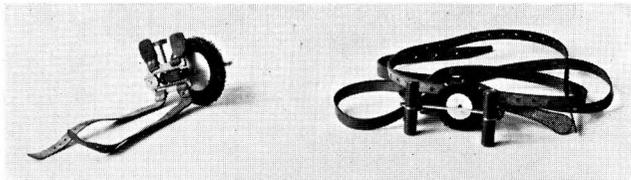


Fig. 125

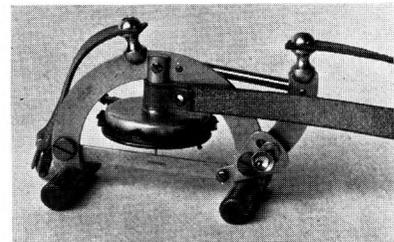


Fig. 130

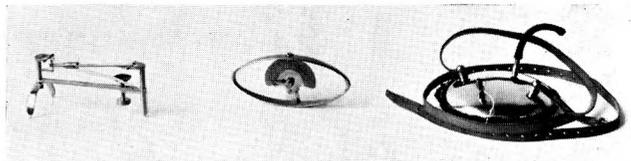


Fig. 126

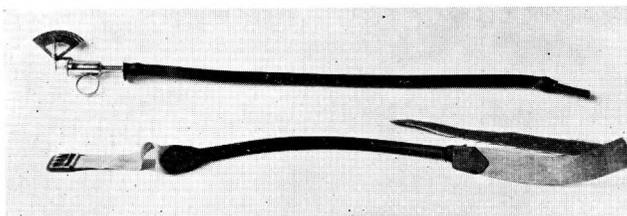


Fig. 127

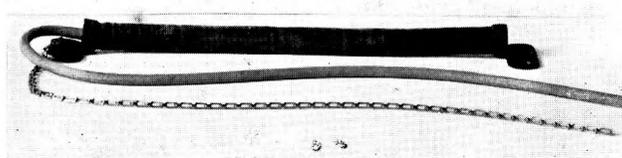


Fig. 128

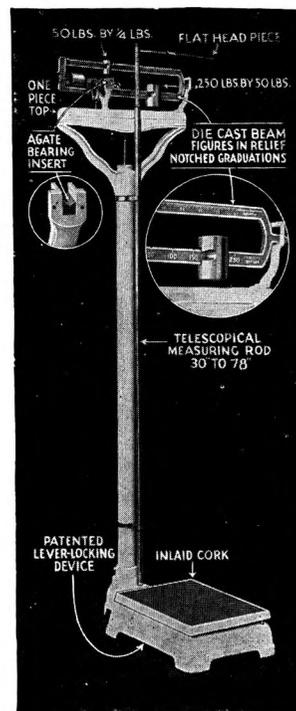


Fig. 131

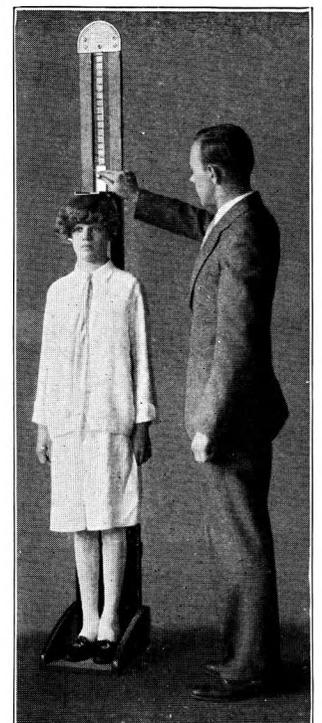


Fig. 132

P-7003	Back & Leg Dynanometer	-	-	-	\$ 85.00.
Fig.35-37					
P-7005	Dry Spirometer	-	-	-	\$ 32.00.
Fig.133					
P-7006	Wet Spirometer	-	-	-	\$ 20.00.
Fig.134					
P-7007	Stroke Test.	-	-	-	\$ 35.00.
Fig.135					
P-7004	Pneumo-dynamometer. (Mathieu)	-	-	-	\$ 25.00.
Fig.127 The breath is expelled through a mouth piece and taken into metal cylinder, in (top) which piston operates so as to move an indicator over a circular scale.					
P-8001	Anthropometric Scale.	-	-	-	\$ 19.00.
Fig.122					
P-8002	Anthropometer Scale.	-	-	-	\$ 48.00.
Fig.131					
P-8003	Stadiometer	-	-	-	\$ 29.00.
Fig.132 Standing, Sitting, Reaching.					
Q-1001	Kymographs. Similar in general appearance to spring drive kymographs shown in figures 136, 138, 144, 146, but electrically driven. The following are specifications:	-	-	-	
TYPE A	Brass drum 6" in diameter, driven by high grade induction motor, with built-in reduction gear. Planetary drive (wood fibre on cast iron). (This induction motor, under constant load, is practically as constant in speed as a synchronous motor.)	-	-	-	\$ 96.00.
This kymograph has variable speed, secured by moving the point of contact of the driving disk. Any one of the following pairs of speed limits may be selected:					
(a) Peripheral speed, from 5 to 12 $\frac{1}{2}$ inches per minute.					
(b) " " " 10 to 25 " " "					
(c) " " " 20 to 50 " " "					
(d) " " " 40 to 100 " " "					
TYPE B	Same as Type A, except that a change gear unit is added, by means of which either speeds (a), (b) and (c) or (b), (c), and (d) may be combined.	-	-	-	\$ 118.00.
TYPE C	Same as Type A, but having true synchronous motor.	-	-	-	\$ 120.00.
TYPE D	Same as Type B, but having true synchronous motor.	-	-	-	\$ 142.00.
TYPE AE	Same as Type A, but having a special stylus carrier which has worm-gear drive, by means of which the record is made in a continuous spiral. There are nine different speeds at which this worm may be driven.	-	-	-	\$ 146.00.
TYPE BE	Same as Type B, but with attachment as described in Type AE.	-	-	-	\$ 168.00.
TYPE CE	Same as Type C, but with attachment as described in Type AE.	-	-	-	\$ 170.00.



Fig. 133

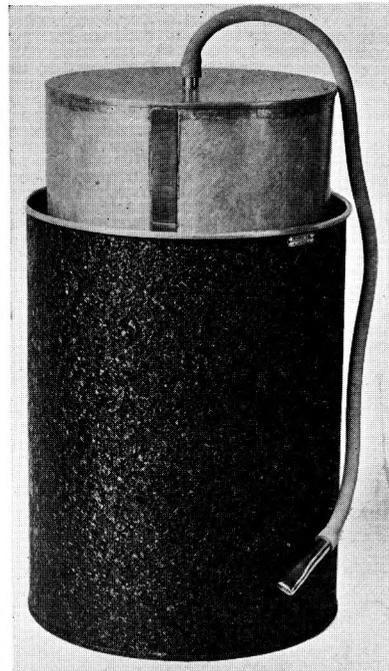


Fig. 134

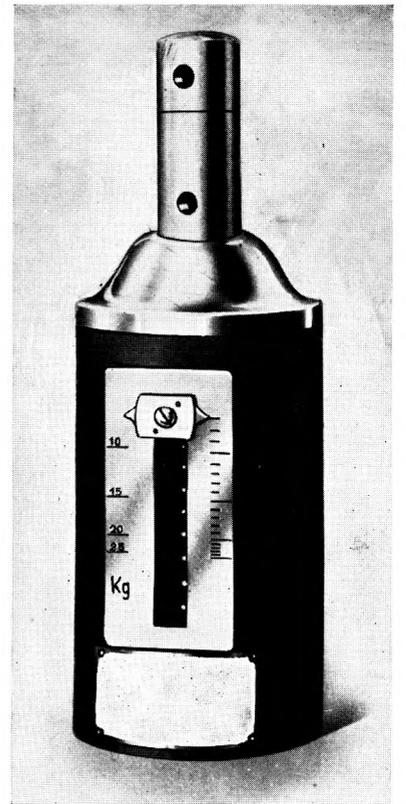


Fig. 135

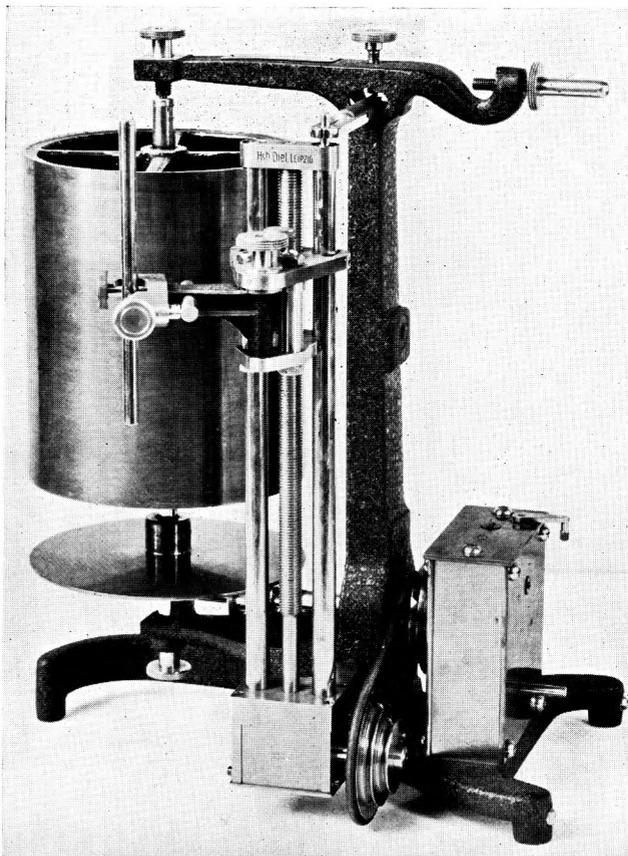


Fig. 136

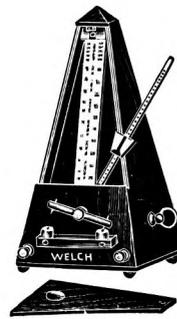


Fig. 137

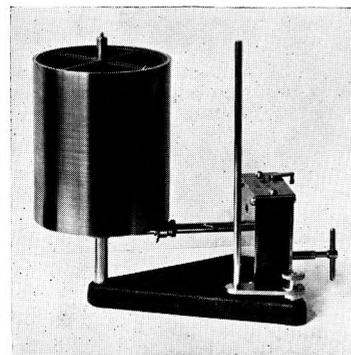


Fig. 138

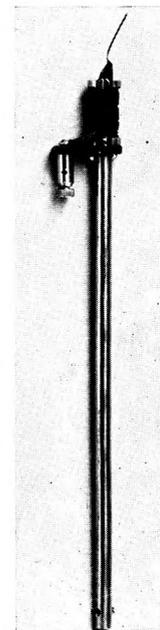


Fig. 139

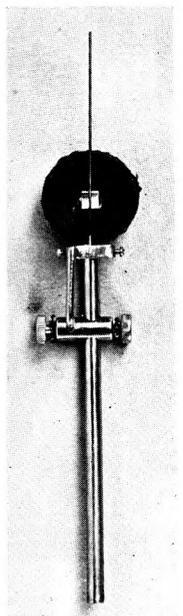


Fig. 140

TYPE DE	-	-	-	-	\$ 192.00.
	Same as Type D, but with attachment as described in Type AE.				
TYPE AF	-	-	-	-	\$ 131.00.
	Same as Type A, but having additional drum unit for <u>long paper</u> . Maximum spread between drum centres, 3 feet.				
TYPE BF	-	-	-	-	\$ 153.00.
	Same as Type B, for long paper.				
TYPE CF	-	-	-	-	\$ 155.00.
	Same as Type C, for long paper.				
TYPE DF	-	-	-	-	\$ 177.00.
	Same as Type D, for long paper.				
P-8004	Facial Goniometer	-	-	-	\$ 25.00.
P-8005	Cranimeter	-	-	-	\$ 47.00.
P-8006	Cranial Calipers	-	-	-	\$ 18.00.
	Fig.35-38				
	Fig.35-39				
Q-1101	Kynograph Smoker.	-	-	-	\$ 10.00.
	Fig.35-48				
Q-2001	Metronome	-	-	-	\$ 6.00.
Q-2002	Metronome, Electric Contacts	-	-	-	\$ 35.00.
	Fig.137				
Q-2003	Stop Clock	-	-	-	\$ 45.00.
	Fig.141				
Q-2101	Electrically Maintained Tuning Fork 50 D.V.	-	-	-	\$ 30.00.
Q-2102	Electrically Maintained Tuning Fork 100 D.V.	-	-	-	\$ 25.00.
Q-2103	Stop Watch	-	-	-	\$ 60.00.
	Fig.147				
	Tenth Second, Double Action Times. A high grade stop watch registering 1/10 of seconds fitted with a 15 jewel chronograph movement. The split second hands make two revolutions per minute. Minute indicator registers half minutes and minutes up to 15 minutes. Start, stop and fly-back by consecutive depressions of the pin in the crown. (Nickel case, 15 jewels)				
Q-2104	Pastor Stop Watch	-	-	-	\$ 10.00.
	Fig.148				
	Nicked finish. Unbreakable crystal. Sweep hand starts, stops, flies back under control of side pin. Shows seconds and fifths of seconds. Stop attachment independent of watch movement.				
Q-2105	Stop Watch.	-	-	-	\$ 15.00.
	Fig.150				
	A plain stopwatch indicating 1/10s of seconds. The long hand travels once around the dial in 30 seconds. The small hand registers up to 15 minutes. The case is made of nickel and chrome finished to retain its bright color. Start, stop and return to zero by successive depressions of the crown. 7 jewel lever movement.				

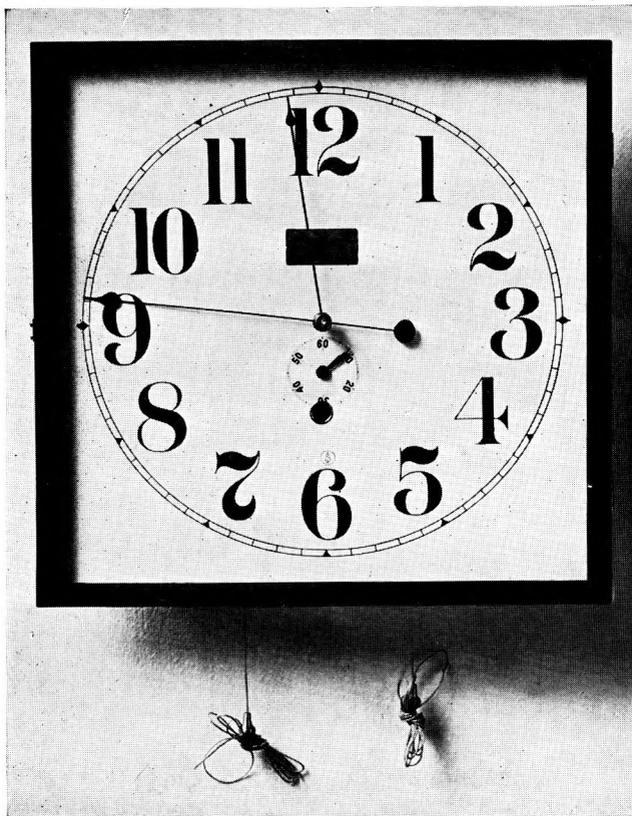


Fig. 141

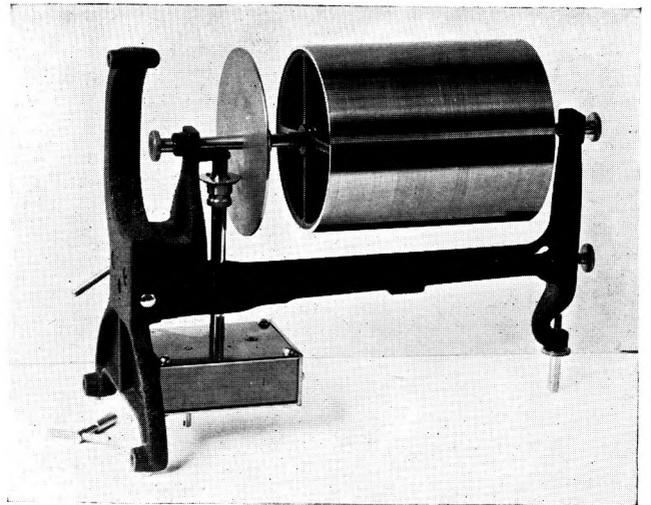


Fig. 144

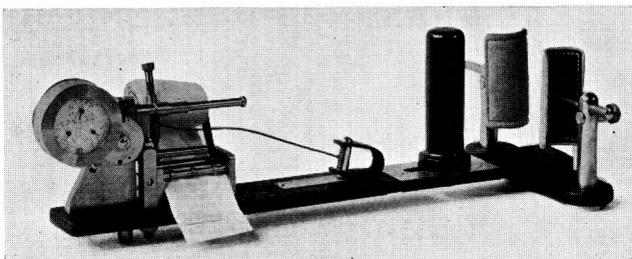


Fig. 142

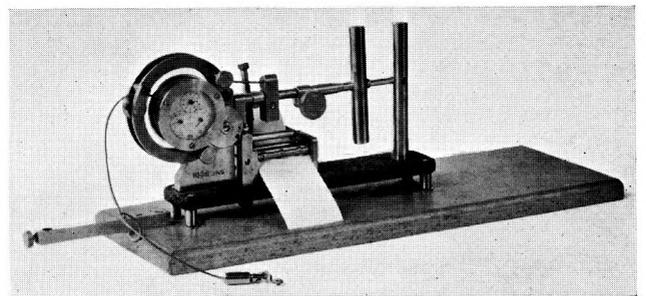


Fig. 145

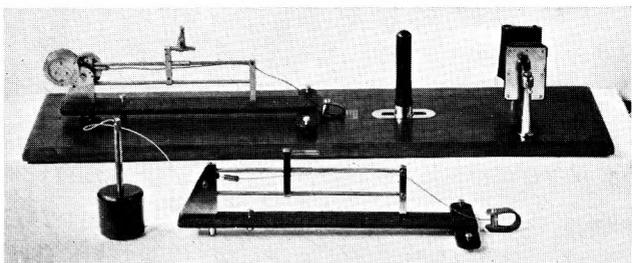


Fig. 143

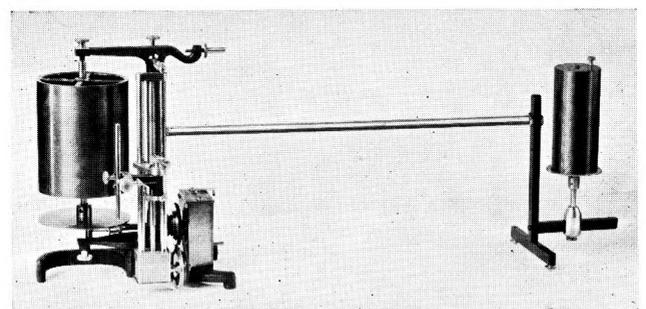


Fig. 146

Q-2106 Stop Watch. - - - \$ 14.00.
 Fig.153 A plain stopwatch indicating 1/5s of seconds. The long hand travels once around the dial in 60 seconds. The small hand registers up to 30 minutes. The case is made of nickel and chrome finished to retain its bright color. Start, stop and return to zero by successive depressions of the crown. 7 jewel lever movement.

Q-2107 1/100 Second Stop Watch. - - - \$ 35.00.
 The large hand makes one complete revolution in 3 seconds, and registers the 1/100th part of a second. The small hand indicates up to 2 minutes. Nickel case, 11 jewels.

Q-2108 1/50 and 1/100 of a Second Stop Watch.
 The most accurate stop watches of this type, fitted with high grade 15 and 17 jewel movements respectively. The large hand makes one complete revolution in 6 seconds. The small hand indicates up to 3 minutes.
 1/50 of a second, 15 jewel - - - \$ 75.00.
 1/100 of a second, 17 jewels - - - \$100.00.

Q-3002 Tunable Marker. - - - \$ 32.00.
 Fig.35-40 This device is offered through the courtesy of Harold Schlosberg, Brown University. For discussion see the Journal of General Psychology, 1932, pages 483-485, from which the following description is quoted:

"A tuned time marker that operates on 60-cycle A.C., and gives a smooth sigmoid curve of 120 cycles per second. The marker is simple, easily adjusted, accurate, quiet, and is durable and powerful enough to be used regularly by untrained students. The vibrating element is a 5-inch piece of piano wire held rigidly at one end, and fitted with a light celluloid tip at the other. The wire is tuned with an adjustable bridge, and the vibrations maintained by a small coil near the free end.

"For use at 120 cycles, the wire should project about 2 1/2 inches beyond the bridge. If regulated alternating current is not available, the marker may be operated through a 100-cycle electrically maintained fork. This will not be as accurate as regulated A. C. If a slower vibration is desired, the length of the vibrating wire may be doubled. The marker can then be operated through a rectifier at 60 cycles. The pressure exerted on the drum by the marker is not important, but the amplitude of vibration must be kept down to 1/4 inch, to prevent "chattering." If properly adjusted, the marker makes a barely audible hum when held firmly in a clamp. This may be practically eliminated by slipping a piece of rubber between the clamp and marker. It will then give a reliable time line, with freedom from distracting noise, for as long a period as desired, without further attention."

Q-3003 Electromagnetic Marker. - - - \$ 8.50.
 Fig.35-41 This is a new design. It has the following characteristics: the moving element is hinged at base, and the spring element against which magnet acts is a small coil spring with adjustable tension; the excursion of the marking point is controlled by means of the screw. It is compact, dependable and inexpensive.

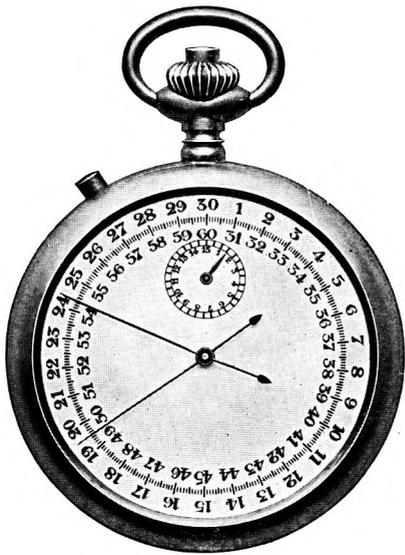


Fig. 147



Fig. 150



Fig. 153

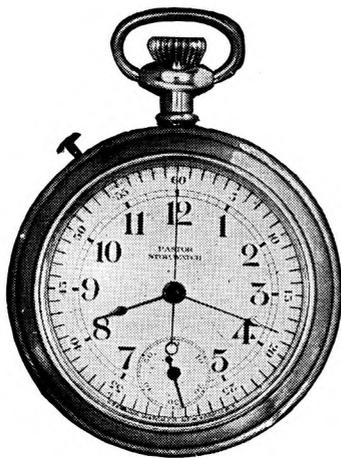


Fig. 148



Fig. 151

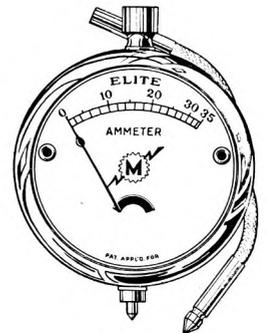


Fig. 154

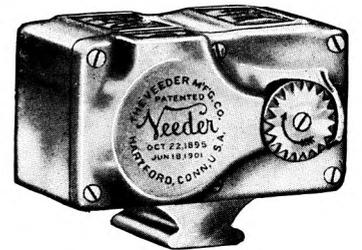


Fig. 155



Fig. 149



Fig. 152

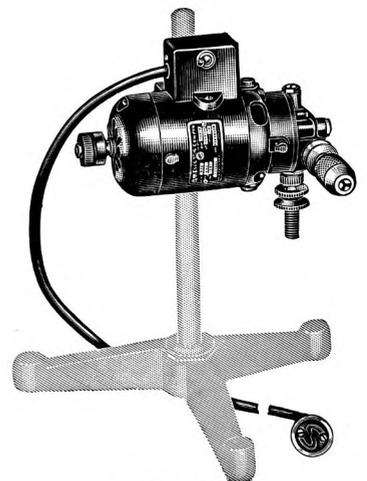


Fig. 156

- Q-3004 Triple Electromagnetic Marker. - - \$ 21.00.
 Fig.35-42 This unit is so constructed, on the principle of 35-41, that the three points occupy a space of only three-fourths of an inch.
- Q-3005 Seconds Marker. - - \$ 30.00.
 Fig.35-43 This unit is constructed on a small synchronous motor,
 Fig.35-44 with contacts so arranged, that, when used with the two-way marker shown in the cut, the record is made in one second, five-seconds, and one minute intervals. A sample of such a record is shown in Figure 35044. The blank space at the position of a five-second mark indicates the end of a one-minute interval.
- Q-3102 Jointed Tambour Marker. - - \$ 15.00.
 Fig.35-45 This device is offered through the courtesy of Robert G.
 Fig.35-46 Krueger, Yale Institute of Human Relations. It is described in The American Journal of Psychology, April 1930. The cuts, Figures 45-46, are here used through the permission of this Journal. The following quotation makes clear the purpose of this form of Tambour Stylus:
 "The stylus of the ordinary tambour is frequently unsatisfactory because of the sloping arc in the tracing which is difficult to measure with exactness, especially where the excursion is large. To eliminate the arc the following design is proposed.
 "Instead of placing the tambour with its stylus tangent to the kymographic drum, in the usual manner, the stylus is mounted at a right angle to the tangent. It consists of two sections, A and B, joined together by means of a hinge. At the end of section A, a small U-shaped piece of stiff paper (D) is attached with cement. The floating glass section (B) is 8 cm. long and $\frac{1}{2}$ cm. in diameter. One end of section B terminates in an arc of 7 mm. radius; the other is bent to form a right angle. The short leg of the angle is inserted in the vertical sides of the paper forming a hinge. A drop of cement on the free end at (C) holds section B in place. The holes in the paper should be just large enough to permit the glass tracer to swing freely when hanging down; if the holes are too large there will be a lateral vibratory movement. The glass section is allowed to ride against the drum, its own weight being sufficient to make the tracing." A typical tracing secured in this way is shown in Fig.35-46.
- Q-4001 Three Unit Electro-Magnetic Counter. - - \$ 18.00.
 Fig.35-47 This cut shows the counter equipment as referred to in the description of attention test, P-5001. These counters may be had singly or in any size units. They are simple, dependable and positive. A ratchet counter is operated by double armature controlled in rotary motion by a pair of small magnets. The action is simple, positive, and dependable.
- Q-4002 Electric Counter. - - \$ 30.00.
 Fig.157 Can be furnished for D.C., any voltage from 6 to 220 or for A.C. 55,110 or 220 volts, 60 cycle.
- Q-4003 Electric Counter. Clock Face Type - High Speed - \$ 27.00.

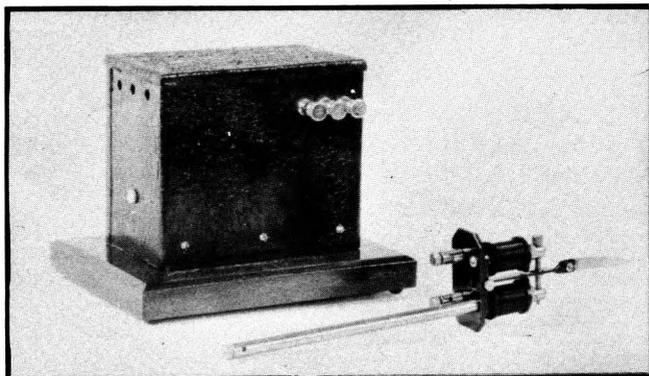


FIG. 35-43

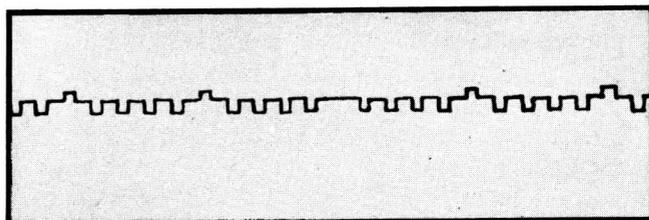


FIG 35-44

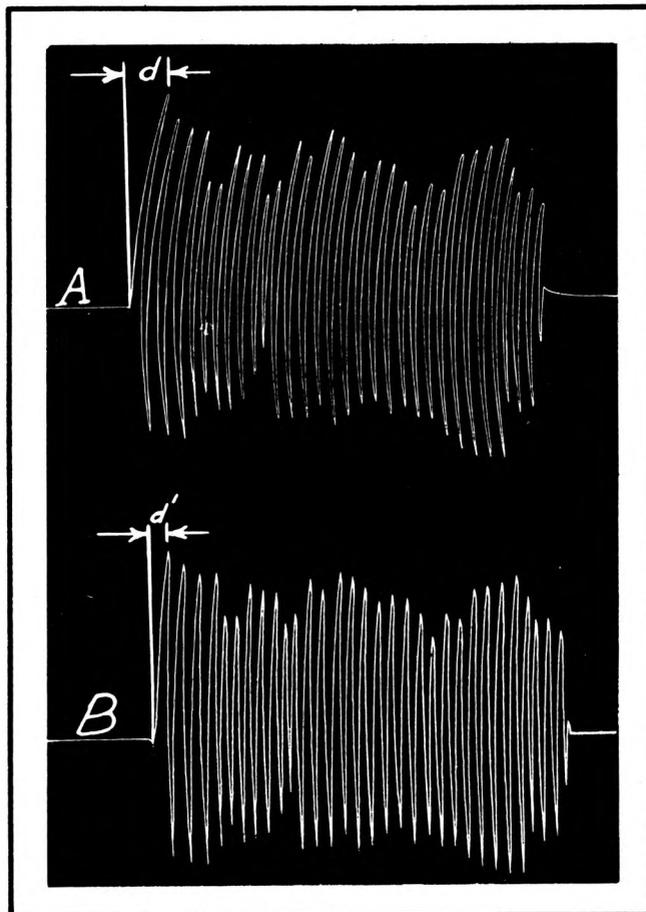


FIG. 35-46

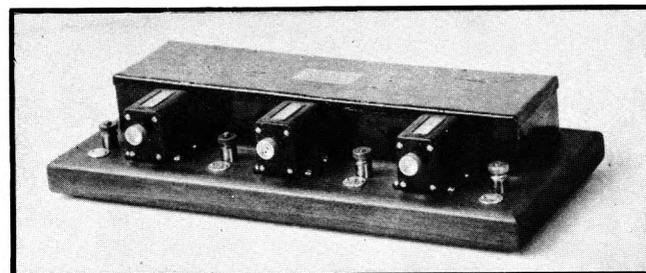


FIG. 35-47

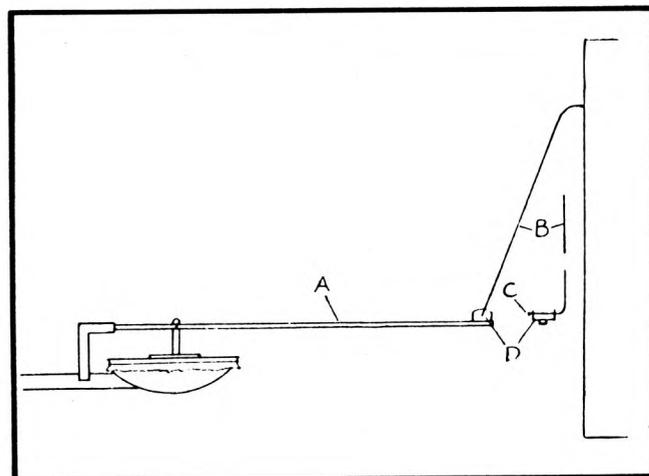


FIG. 35-45

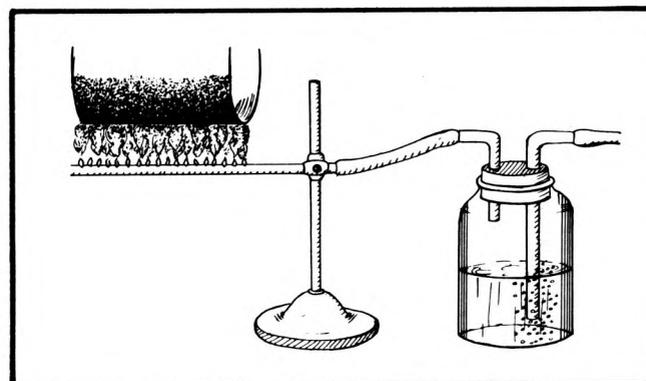


FIG. 35-48



Fig. 157

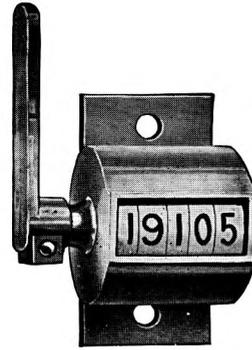


Fig. 161

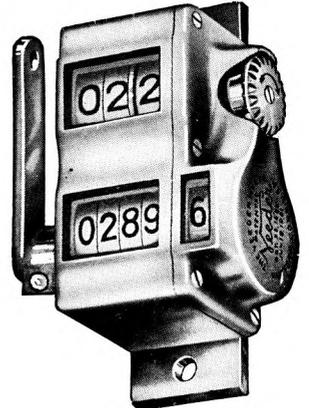


Fig. 166

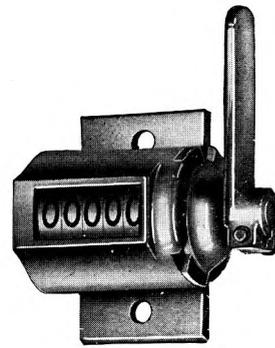


Fig. 162

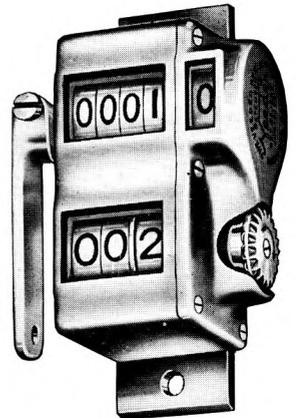


Fig. 167

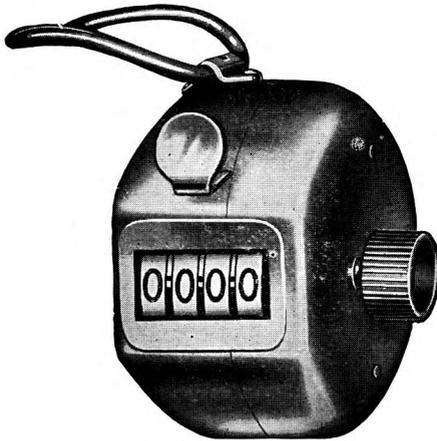


Fig. 158

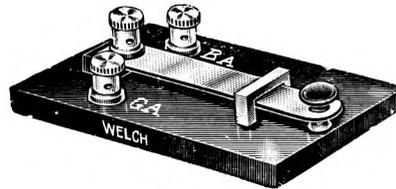


Fig. 163

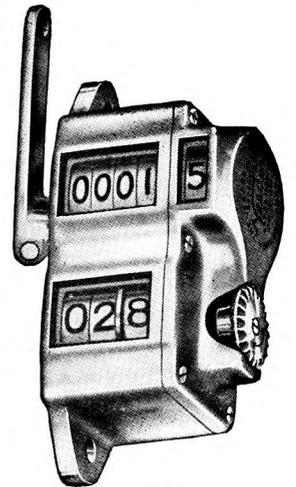


Fig. 168

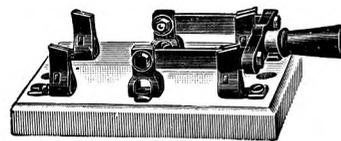


Fig. 164

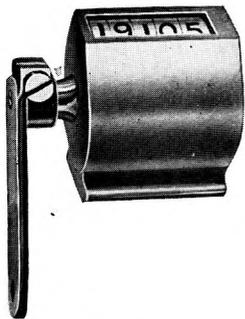


Fig. 159

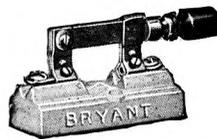


Fig. 160

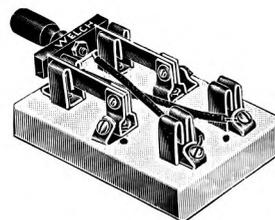


Fig. 165

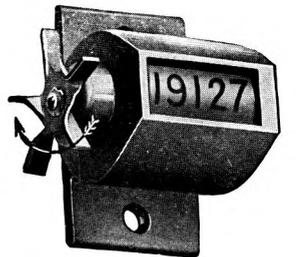


Fig. 169

Q-4101 Counters.

Counters should be specified according to the following table of characteristics:

A. Type 1 - Simple Counter	-	-	\$ 3.00.
2 - Reset Counter	-	-	\$ 7.00.
3.- Double Counter	-	-	\$ 4.50.
a) Total at top, reset at bottom			
b) Total at bottom, reset at top			
4 - Special (a) Star Wheel	-	-	\$ 3.00.
(b) Hand Tally	-	-	\$ 5.00.
(c) Speed Counter, with clutch	-	-	\$ 4.50.
(d) Speed Counter, without clutch	-	-	\$ 3.50.
B. Counting Method.			
1. One revolution counts one.			
2. One-tenth revolution counts one			
3. Ratchet; counts one for each oscillation of shaft through 40 to 45 degrees. Has stops and return spring.			
4. Star Wheel; counts one for each one-fifth revolution.			
C. Style of Case -			
1. Flange at Window.			
2. Flange at Base			
3. Gib Case			
4. Lug at Side			
D. Shaft Position -			
1. on left			
2. on right			
E. Rotation Direction -			
1. Top of Shaft turns toward observer			
2. Top of Shaft turns from observer			
F. Record -			
1. Three figures			
2. Four figures			
3. Five figures (standard)			

To illustrate above specifications:

Figure 155 represents A 3 (b), B 1 (or 2), C 3, D 1, E 1 (or 2) F 3
 Figure 158 represents A 2 and 4 (b), B 3, F 2
 Figure 159 represents A 1, B 1 (or 2), C 3, D 1, E 1 (or 2), F 3
 Figure 161 represents A 1, B 1 (or 2), C 2, D 1, E 1 (or 2), F 3
 Figure 162 represents A 1, B 3, C 2, D 2, D 1, E 1 (or 2), F 3
 Figure 166 represents A 3 (b), B 1 (or 2), C 2, D 1, E 1 (or 2), F 3
 Figure 167 represents A 3 (a), B 1 (or 2), C 2, D 1, E 1 (or 2), F 3
 Figure 168 represents A 3 (a), B 1 (or 2), C 4, D 1, E 1 (or 2), F 3
 Figure 169 represents A 4 (a), B 4, C 2, D 1, E 1, F 3
 Figure 172 represents A 4 (d), B 1, D 1, E 1, F 5.

Q-4012 Stop Watch Tachometer. - - - \$ 27.00.
 Fig.173

Q-5001 Electric Motor, Universal Laboratory Type (Bodine) - \$ 27.00.
 Fig.149 The Bodine University Laboratory Motor is a compact,
 Fig.151 variable speed power unit for use in lecture demonstrations.
 Fig.152 This portable unit weighs approximately 8 lbs., has a maximum height of 9 inches and is supported on a cast iron base which also contains the rheostat for varying the motor speed. The entire unit is finished in baked enamel with nickel-plated trimmings, and is provided with a 5-foot attachment cord and plug.

The motor is furnished with a 5/16-inch shaft. A 3/4-inch shaft extension is provided at each end of the motor for a

single groove pulley or other shaft driven devices. The motor is supported on a detachable swivel stud that has two sockets, one vertical and one horizontal. This offers a very simple and easy means of setting the motor at any angle or height as shown in the various illustrations in this bulletin. The extreme flexibility of the motor mounting adapts the unit perfectly to the miscellaneous requirements of lecture table and laboratory work.

The speed adjustment by means of the rheostat in the base, is from standstill up to 10,000 R. P. M. without load and up to 6,000 R. P. M. under full load.

The motor is a universal motor, being so wound that it will operate equally well from any 100-volt direct current circuit or from any alternating current circuit up to 60 cycles. The motor is rated at approximately 1/30 h.p., and may be operated from any lighting circuit.

Q-5101	Ammeters and Voltmeters.			
	Ammeter and Voltmeter combined:	35 amps 10 volts	--	\$ 1.75.
	Ammeter 0-30 amperes		--	\$ 1.50.
	Voltmeter 0-10 volts		--	\$ 1.25.
	Milliammeter 0-5000 milliamperes		--	\$18.00.
Q-5111 Fig.163	Short Circuiting Key		--	\$ 13.00.
Q-5122 Fig.160 Fig.164	Knife Switches, porcelain base, 15 amp.			
	Single pole, single throw		--	\$.50.
	Single pole, double throw		--	\$.60.
	Double pole, single throw		--	\$.70.
	Double pole, double throw		--	\$.80.
Q-6110 Fig.170	Galvanometer.		--	\$45.00.
	This galvanometer is of the suspended moving coil reflecting type, complete with telescope and scale. The sensitivity expressed in terms of current applied to the terminals which will produce a deflection of one millimeter at a scale distance of one meter is 0.014 micro-ampere.			
Q-6111 Fig.171	Resistance Box.		--	\$45.00.
	This box has ten coil decades adjusted to 1/10%; a high-grade instrument designed to meet the demand for dial resistances at a moderate cost. This four dial resistance box 10 (0.1 1 10 100).			
Q-6113 Fig.175	Wheatstone Bridge Rheostat.		--	\$ 60.00.
	This rheostat has 4 decades 10 (1 10 100 1000) and a single dial control for Radio arms. There are 7 multipliers, 0.001, 0.01, 0.1, 1, 10, 100, and 1000. Adjusted to 1/20% in bridge arms and 1/10% in Rheostat.			
Q-6201 Fig.176	Rheostats			
	6 ohms 7.3 amps	--	\$6.00	100 ohms 2 amps \$ 6.00.
	12 ohms 5.6 amps	--	\$6.00	190 ohms 1.7 amps \$ 6.00.
	20 ohms 4.2 amps	--	\$6.00	600 ohms 1.5 amps \$ 6.00.
	50 ohms 3.3 amps	--	\$6.00	2300 ohms .8 amps \$ 6.00.
	70 ohms 2.5 amps	--	\$6.00	

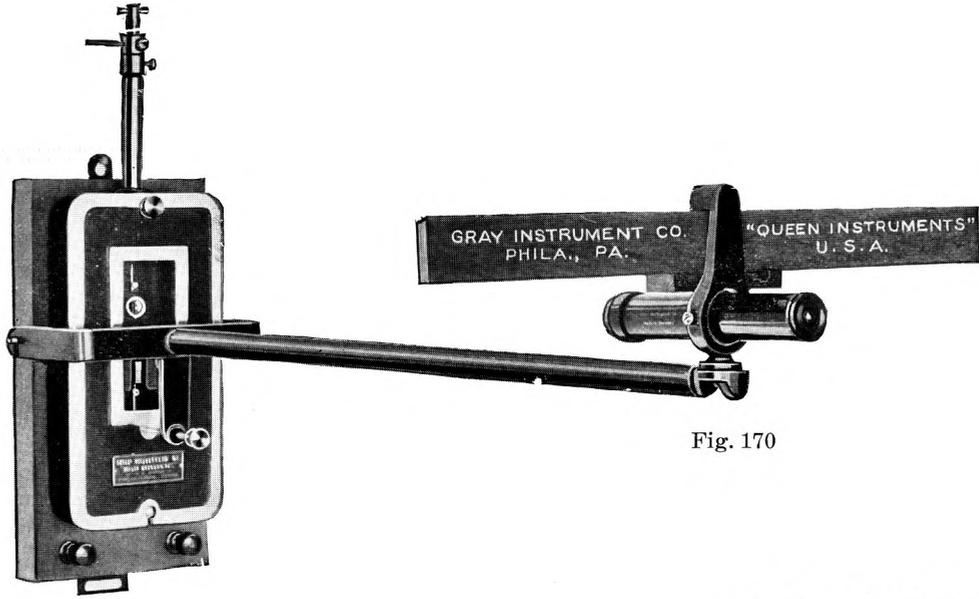


Fig. 170

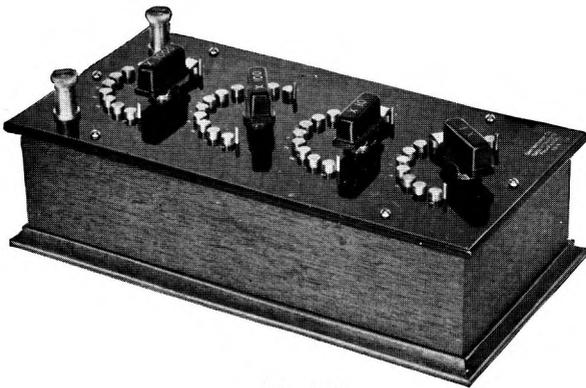


Fig. 171



Fig. 174

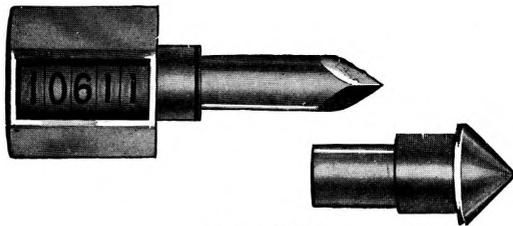


Fig. 172

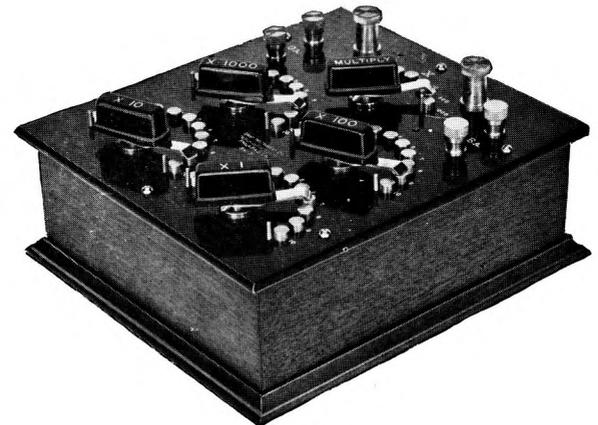


Fig. 175

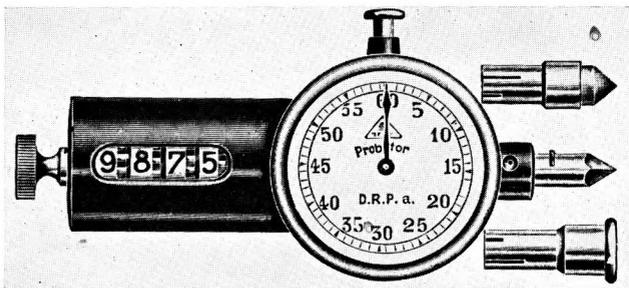


Fig. 173

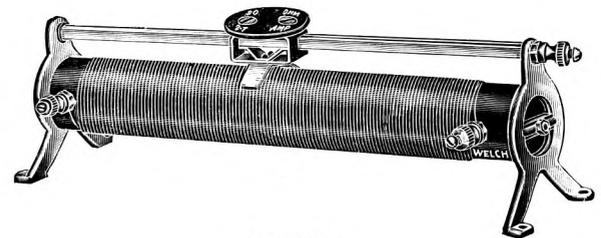


Fig. 176

Q-6202	Commutators.			
Fig.165	Knife Switch Commutator	-	-	\$ 1.25.
	Pohl Commutator	-	-	\$ 4.50.
Q-6203	Telegraph Key	-	-	\$ 2.75.
Q-6204	Telegraph Sounder	-	-	\$ 3.00.
Q-6205	Photoelectric Cell	-	-	\$10.00.
Q-6206	Transformers, 110 volts Step Down	-	-	\$ 5.00.
	Secondary voltages $2\frac{1}{2}$ to 25 in $2\frac{1}{2}$ volt steps.			
Q-6207	Transformers, Step Up			
	Secondary Voltage 3,500	-	-	\$10.00.
	Secondary Voltage 5,000	-	-	\$11.00.
	Secondary Voltage 10,000	-	-	\$15.00.
Q-6208	Mercury Switch.	-	-	\$ 7.50.

Q-9001	Tripod Bases			
1.	Length of leg, 9cm - takes 10 mm rod	-	-	\$.65.
	With leveling screws	-	-	\$ 1.95.
2.	Length of leg, 11cm - takes 10mm rod	-	-	\$.95.
	With leveling screws	-	-	\$ 2.20.
3.	Length of leg, 13.5cm - takes 13mm rod	-	-	\$ 1.10.
	With leveling screws	-	-	\$ 2.45.
4.	Length of leg, 15.8cm - takes 13mm rod	-	-	\$ 1.55.
	With leveling screws	-	-	\$ 2.80.
5.	Length of leg, 15.8cm - takes 19 mm rod	-	-	\$ 1.65.
	With leveling screws	-	-	\$ 3.05.
6.	Length of leg, 20cm - takes 19 mm rod	-	-	\$ 2.65.
	With leveling screws	-	-	\$ 3.40.
7.	Length of leg, 22cm - takes 30mm rod	-	-	\$ 4.40.
	With leveling screws	-	-	\$ 6.50.
8.	Length of leg, 40cm - takes 30mm rod	-	-	\$10.00.
	With leveling screws	-	-	\$12.00.

SUPPORT RODS

To fit Bases 1 and 2	Length ---	10cm	20cm.	30 cm	40cm		
	Each ---	.35	.45	.50	.65		
To fit Bases 3 and 4	Length--	20cm	40cm	60cm	80cm	100cm	125cm
	Each --	.65	.80	.95	1.10	1.45	2.05
To fit Bases 5 and 6	Length--	30cm.	40cm	60cm	80cm	100cm	125cm
	Each--	.85	1.05	1.30	1.50	1.70	2.10
To fit Bases 7 and 8	Length--	80cm	100cm	120cm	160cm		
	Each --	3.75	4.25	5.10	5.85.		