

**APPARATUS
FOR EXPERIMENTAL WORK
AND RESEARCH IN**

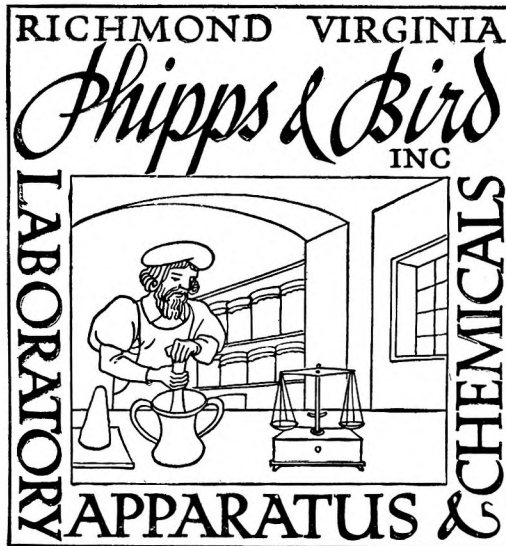


**PHARMACOLOGY
PHYSIOLOGY — PSYCHOLOGY
EXPERIMENTAL THERAPEUTICS
AND RELATED SUBJECTS**



Modern Tools of Science

**PHIPPS and BIRD Inc.
RICHMOND - VIRGINIA**



We present BIRD KYMOGRAPHS and RECORDING EQUIPMENT, together with certain allied items.

In the design and construction of our equipment, we have made use of modern engineering knowledge and methods. The result is that our KYMOGRAPHS are all motor-driven.

We offer INK WRITING

PENS and GRAVITY WRITING LEVERS.

It is our belief that we have an obligation to develop, within the field that we have selected, equipment which will be in keeping with modern scientific progress. We pledge the continuance of our best efforts to develop and produce equipment which will meet modern needs.

APPARATUS FOR EXPERIMENTAL WORK AND RESEARCH

in

PHARMACOLOGY • PHYSIOLOGY • PSYCHOLOGY
EXPERIMENTAL THERAPEUTICS AND RELATED SUBJECTS

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PRICES: All prices here shown are current at the time of publication but are subject to change without notice. Customers who send their orders without previous quotations are assured that the prices invoiced will be those current on the date of shipment.

TERMS: To those customers who have established credit, payment of invoices is required within thirty days from date of shipment. Export orders are handled in accordance with conditions abroad and terms agreed upon when order is accepted.



BIRD
KYMOPGRAPHS

Improved Design

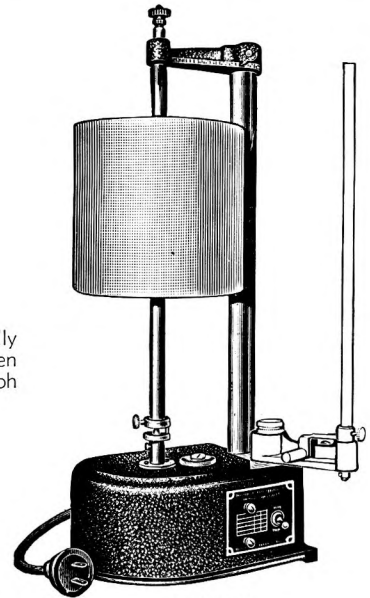
A 70-060

KYMOPGRAPH—Bird. Embodies many features representing marked advances. Rugged in construction, simple and convenient to operate, it may be used for routine laboratory work or for research.

Constant speeds are obtainable by an induction motor drive working from 110 volts, 60 cycle A.C. A gear box in the base permits four speed changes: (1) 2.2 cm. per minutes, (2) 11.0 cm. per minute, (3) 54 cm. per minute, (4) 270 cm. per minute. A 100 vibration per second tuning fork may be conveniently used with the highest speed; one second intervals, with the lowest speed.

The aluminum chart drum, 150 mm. high, and 165 mm. in diameter is adjustable in height over a range of 175 mm. The base is of heavy, cast aluminum, finished with corrosion resistant wrinkled enamel. Overall dimensions are 500 mm. high, 215 mm. deep, by 165 mm. wide.. 56.00

Electrically
Driven
Kymograph



A 70-060
Improved Bird
Design

HIGH SPEED MODEL

A 70-070

KYMOPGRAPH—Bird, High Speed Model. A model designed in response to many requests for an electrically driven kymograph having higher speeds than the standard model. It is similar in construction to the No. A 70-060 Kymograph, and has the following speeds: (1) 4.0 cm. per minute, (2) 20 cm. per minute, (3) 103 cm. per minute, (4) 456 cm. per minute. For 110 volts, 60 cycle, A.C..... 60.00

DRUM

A 70-080

DRUM—Kymograph, 254 mm. (10 inches) High by 165 mm. Diameter. For use with kymograph No. A 70-060, No. A 70-070 and on auxiliary drum No. A 70-130..... 5.00

REDUCING GEARS

A 70-090

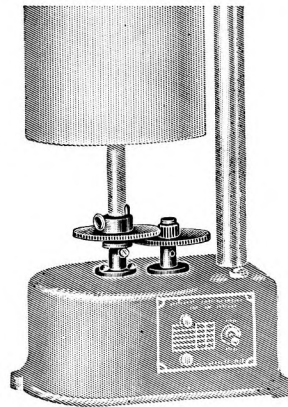
GEARS—Reducing. Designed to be attached to the top of the gear box on the No. A 70-060 kymograph. This attachment is simply and easily made, and increases the number of speeds to eight.

The eight speeds are as follows: (1) 0.98 cm. per minute; (2) 2.2 cm. per minute; (3) 4.9 cm. per minute; (4) 11 cm. per minute; (5) 24 cm. per minute; (6) 54 cm. per minute; (7) 120 cm. per minute; (8) 270 cm. per minute.

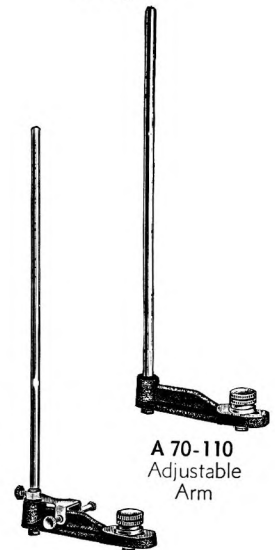
Gears are of brass, individually cut, and nickel plated. Per set..... 18.00

A 70-100

GEARS—Reducing. Mounted in the same fashion as the No. A 70-090 reducing gears. They are cut, however, to give a reduction of 25 to 1 instead of 2.5 to 1. Therefore, they increase the number of available speeds to six. They are provided for the purpose of giving extremely slow speeds. The slowest speed possible with these gears on the No. A 70-060 kymograph is one revolution in five hours and forty-five minutes. Gears are of brass, individually cut, and nickel plated. Per set. 18.00



A 70-090
Reducing Gears



A 70-110
Adjustable
Arm

A 70-120
Tangent Screw

A 70-110

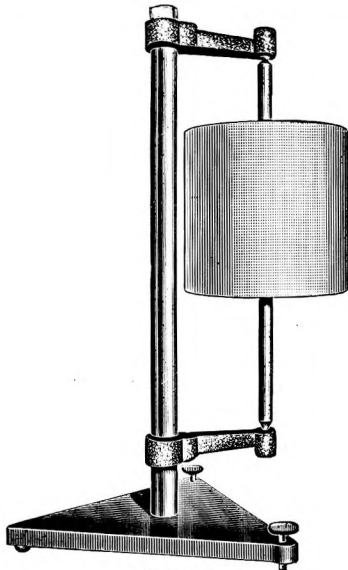
SUPPORT ROD—Plain. Mounted on an adjustable arm which can be secured to a machined surface provided on the base of kymographs No. A 70-060 and No. A 70-070. Such attachment insures automatic alignment between the rod and the axis of the kymograph drum. A support is much more convenient and stable than an independently placed semi-circular stand.

A slot in the arm allows writing levers to be clamped at any distance up to 8 inches from the drum. The rod itself is of stainless steel and the machined support arm is finished in black corrosion-resistant enamel..... 5.00

A 70-120

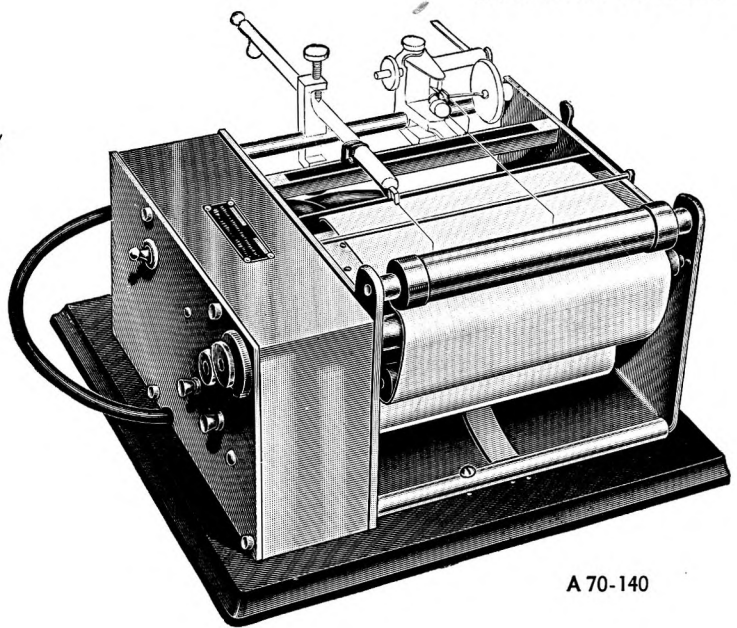
SUPPORT ROD—Similar to No. A 70-110, except with a tangent screw adjustment for bringing writing points gently and exactly against a kymograph drum or other recording surface.... 10.00

BIRD KYMOGRAPH
CONTINUOUS FEED

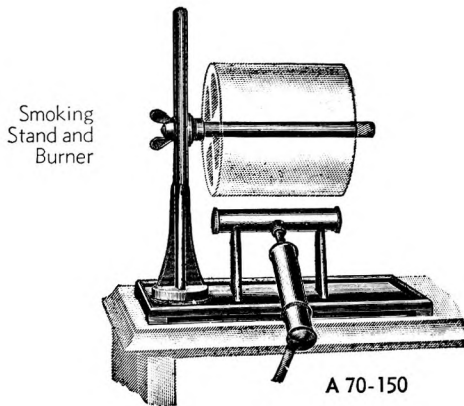


A 70-130

Auxiliary
Drum



A 70-140



Smoking
Stand and
Burner

A 70-150

A 70-130

DRUM—Auxiliary, for Long Paper. Designed for the conversion of kymographs No. A 70-060 and No. A 70-070 into long paper models. Paper lengths of eighty feet are practical. Greater than usual flexibility is assured since the distance that the drum may be placed from the kymograph is not hampered by a rigid rod connection. The drum may be set at any height on the ½ inch, ball-bearing mounted steel rod. Two leveling screws in the base permit alignment of drums relative to one another and allow for irregularities of the table and surface of the paper. 24.00

A 70-140

KYMOGRAPH—Bird, Continuous Feed. The outstanding features of modern industrial recorders are retained in this instrument without losing the versatility necessary for kymograph work. Ink writing levers are used exclusively.

An eighty foot roll of glazed paper, 6 inches wide, is easily inserted in the instrument, and records of any practical length can be made. Eight speeds permit choice of a speed for almost every reaction. Speeds are as follows: (in cm. per minute) (1) 2.12, (2) 4.2, (3) 11.0, (4) 20.5,

(5) 54.0, (6) 103, (7) 246, (8) 456. Speed changes are quickly and easily made by varying the positions of two projecting knobs, and by reversing the positions of two outside gears. A "take-up" roll is provided for use where records of considerable length are to be made.

The gears are individually cut. A shaded pole, induction motor supplies the power. All exposed metal parts are of nickel plated brass. The base has a black enamel finish. A 6 inch reservoir and pen lifter are standard equipment. For use on 110 volts, A.C., without levers. 175.00

A 70-150

SMOKING STAND and BURNER—The spindle is mounted on ball bearings and turns easily. The stand will take cylinders up to 12 inches. The burner is included. 35.00

A 70-160

PAPER—Kymograph, Roll. Litho-coated on one side, 60 pound substance, for use with kymographs No. A 70-060 and No. A 70-070 and with long paper drum No. A 70-130, 5¾ inches wide x 200 yards long. Per roll. 3.25

A 70-170

PAPER—Kymograph, Roll. Similar to above, but for use with drum 10 inches wide. Rolls are 200 yards long. 5.00

A 70-180

PAPER—Kymograph, Roll. Blank white chart paper in rolls, 80 feet long x 6 inches wide, for use with Bird Continuous Feed Kymograph No. A 70-140 only. Per roll. 1.25

A 70-190

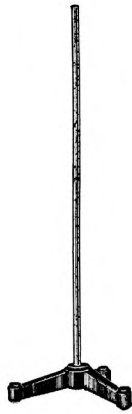
PAPER—Kymograph, Strips. Litho-coated on one side, 60 pound substance, for use with kymographs No. A 70-060 and No. A 70-070, 5¾ inches wide x 21 inches long, gummed at one end. 100 strips. 2.50

INK—SUPPORTS—CLAMPS

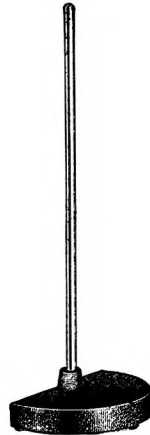
Add Convenience in Kymograph
Recording Operations



A 70-200
Also See
A 70-210



A 70-220



A 70-230



A 70-240



A 70-260



A 70-250

A 70-200

INK—Red. For use with all Bird Ink Writing Levers. 4 Ounces 1.00

A 70-210

INK—Blue. For use with all Bird Ink Writing Levers. 4 Ounces 1.00

A 70-220

SUPPORT—Tripod Base, Stainless Steel Rod. Support consists of a heavy cast iron tripod base finished in black japan. The threaded vertical rod is made of stainless steel, 24 inches long 1.80

A 70-230

SUPPORT—Semicircular Base. A heavy iron base with stainless steel rod 15 inches long. The semicircular base permits the vertical rod to be brought extremely close to a kymograph drum or other recording surface. Each 1.70

A 70-240

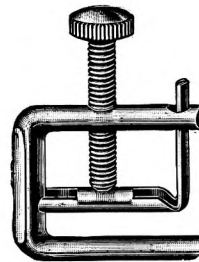
SUPPORT—Similar to above, except with a tangent screw adjustment for bringing writing points gently and exactly against the recording surface 4.75

A 70-250

CLAMP—Flat-jawed or Femur. Made of brass with two hinged jaws mounted on a brass rod. A thumb screw closes the jaws and a spring releases them. The clamping faces of the jaws are slotted for a firm grip on the material to be held 1.95

A 70-260

CLAMP—Double, Right Angle. For attaching any piece of apparatus mounted on a rod to vertical support rods up to 11 mm. diameter. The frame is milled from brass, nickel-plated. Brass thumb screws are used for clamping..... .90



A 19-070



A 70-270



A 29-820

A 70-270

CLAMP—Platform. Especially built to hold signal magnets at the right height for best operation on the Bird Continuous Feed Kymograph. It may be used, also, for general laboratory purposes 1.25

A 19-070

CLAMP—Hoffman, Nickel-plated and Open Jaw. For rubber tubing with a maximum diameter of ½ inch25

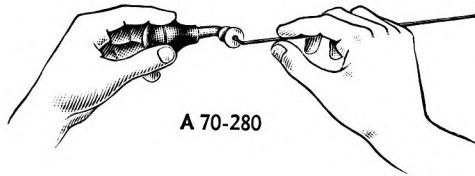
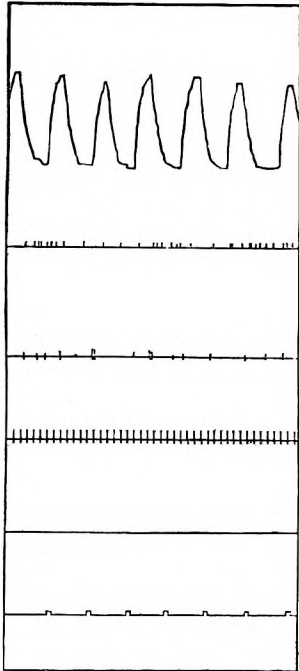
A 29-820

FORCEPS—Artery, (Serrafines). Of nicked steel, bent form, self-closing, with corrugated points, 56 mm. long 1.10

A 29-810

FORCEPS—Artery. Similar to forceps No. A 29-820 except straight form 1.10

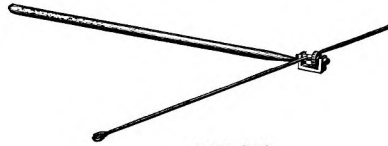
KYMOGRAPH ACCESSORIES



A 70-280



A 12-760



A 70-300



A 70-320

PEN STARTING

- a. Fill reservoir two-thirds full of ink, using the dropper furnished.
- b. Press writing tip through rubber cap of the pen starter. (Fig. 1)
- c. Press bulb of pen starter until ink bubbles in the reservoir. Release bulb, which then causes ink to flow through pen.
- d. Remove starter, and let pen drop to writing surface by gravity.
- e. After bubbles in ink reservoir have subsided, fill reservoir completely.

A 70-280

PEN STARTER—For starting ink flow in capillary pens..... .60

A 70-290

PEN CLEANER—For cleaning all ink writing pens..... .10

A 12-760

CEMENT—Duco, In Collapsible Tubes. A transparent, flexible, water-proof cement which hardens quickly and is suitable for fastening writing points..... .25

A 70-300

LEVER—Heart. An improved type of lever in which the pivot shaft serves as a clamp which permits the insertion of an aluminum wire stylus without the use of tools..... 1.75

A 70-310

STYLUS—Aluminum Wire. For heart lever No. A 70-300..... .40
Lots of 12, 30% discount.

A 70-320

LEVER—Heart, Gravity Writing Point. Lever similar to No. A 70-300, except that the pivot shaft is swiveled to allow the writing point to fall against the kymograph drum by gravity, thus making for lighter and more even pressure and ease of adjustment..... 3.75

A 70-330

GRAVITY WRITING POINT—For heart lever No. A 70-320..... .40
Lots of 12, 30% discount.

LEVERS—Gravity Writing. The writing pressure is obtained from the weight of the writing lever itself since it is pivoted at the axis of rotation. The writing lever is pivoted so that it is free to move toward or away from the writing surface, and the axis of this pivot is inclined toward the writing surface. This causes a small fraction of the weight of the writing lever to exert pressure against the writing surface. Such pressure is constant within the limit of the excursion.

This method of writing eliminates all special tension adjusting accessories because there is no spring tension to be carefully adjusted and the exact position of the writing lever relative to the kymograph drum does not have to be controlled.

A sample of the quality of the inked trace made, using ink writing pens. This record was made at Cornell University with student pilots as subjects and was described as follows:

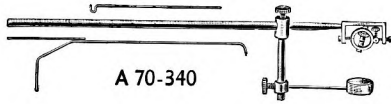
“The top line denotes respiration, obtained by the use of your excellent Pneumograph, the next two are parotid secretion, and the third, the pulse record we obtained with our Cardiotachometer.”

LEVERS—Ink Writing, For Physiological Apparatus. The development of gravity writing, whereby writing points are held against the drum by gravity, which is constant, rather than by spring tension, which varies with pen movement, made possible the successful development of Bird Ink Writing Levers.

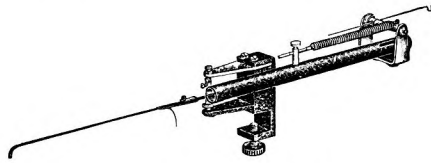
The pens, of corrosion-proof, stainless steel, are inserted into the pivot clamp of the recording instrument at the axis, beneath which an ink reservoir is suspended. An offshoot of the pen dips into the reservoir. The ink flows from the reservoir and through the pen by capillarity, making an easily photographed line comparable to the best tracings. The weight of the pen filled with ink is constant and is so slight that loss in sensitivity is negligible. Friction is less than when writing on smoked drums.

If pens are cleaned within a few hours after use, clogging is negligible. A pen cleaner and starter are supplied with each pen.

HEART AND
MUSCLE LEVERS



A 70-340



A 70-360

A 70-340

LEVER—Heart, Ink Writing, With Pen. An improved form of lever utilizing the gravity type point in which the pivot shaft serves as a clamp so that the pen may be easily removed for cleaning. The pen is suspended independently of the ink reservoir and merely dips below the ink surface, thus eliminating the inertia of the reservoir. A separate lever for heart attachment slides through a collar on the pivot for variation of sensitivity and excursion and is locked in place by a small knurled screw 6.25

A 70-350

PEN—For heart lever No. A 70-340. Of stainless steel capillary tubing 3.00

A 70-360

LEVER—Heart, Horizontal Type, Ink Writing, With Pen. A compact, sturdy variable sensitivity heart lever for use with the Bird Continuous Feed Kymograph No. A 70-140. Heart attachment is made in the conventional manner with the attachment vertical. A light, double lever arrangement changes the direction of the movement, and the record is made by a horizontally operated pen. The pen is of stainless steel tubing through which ink flows by capillarity. Pen pressure against the paper is adjusted by means of a small screw.

Magnification changes are effected by changing the length of the heart attachment lever. Sensitivity changes are made by adjusting the tension of a small coil spring. The attachment clamp is built as an integral part of the frame. 22.50

A 70-370

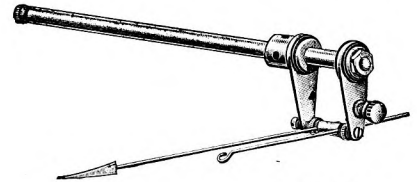
PEN—For heart lever No. A 70-360, of stainless steel 3.00

A 70-380

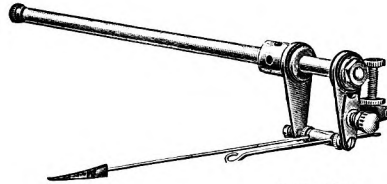
LEVER—Muscle. A sturdily built muscle lever suitable for both heavy and light muscle work. The lever is pivoted on a yoke, mounted on and insulated from a nickel plated brass rod. The length of the lever is adjustable and is provided with a loop for attachment of the muscle and weights. Binding posts on the yoke and on the rod are provided for electrical connection. . 2.75

A 70-390

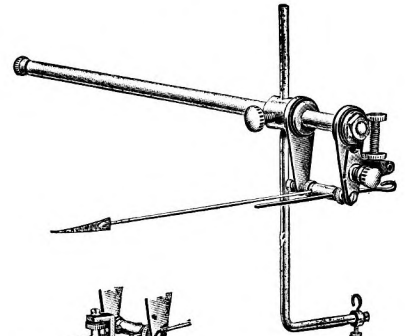
LEVER—Muscle. Similar to No. A 70-380, except that it has provision for after-loading. Each 3.75



A 70-380



A 70-390



A 70-400

A 70-400

LEVER—Muscle. Similar to A 70-390, except with a tubular support for use with muscle warmer No. A 70-530. 4.25

A 70-410

LEVER—Muscle, With Gravity Writing Point. Similar to No. A 70-380, except that a swivel is provided which can be attached with the lever, as shown in illustration. The writing point is inserted in this swivel instead of the main swivel clamp lever so that it falls against the drum by gravity. Lighter and more even pressure is thus provided and adjustment for writing is easier. Each. 3.75

A 70-420

LEVER—Muscle. Similar to No. A 70-410, except with provision for after-loading 4.75

A 70-430

LEVER—Muscle. Similar to No. A 70-420, but with a tubular support for use with muscle warmer No. A 70-530. 5.25

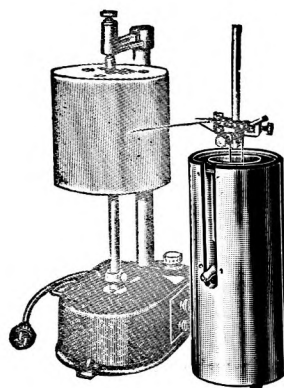
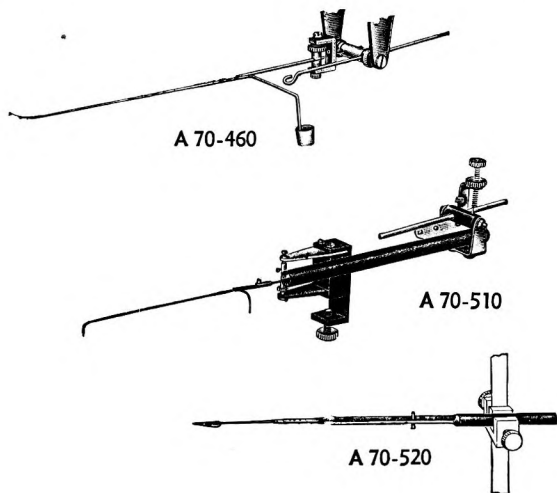
A 70-440

GRAVITY WRITING POINT—Including swivel for muscle levers, Nos. A 70-410, A 70-420 and A 70-430 1.00

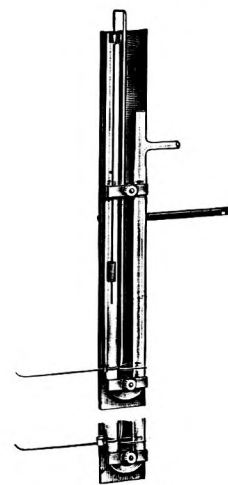
A 70-450

WRITING POINT—For muscle levers, A 70-380 through A 70-430 1.00

MUSCLE LEVERS AND WARMER



A 70-530
Muscle Warmer



A 70-540
A 70-560

A 70-460

LEVER—Muscle, Ink Writing With Pen. Similar to No. A 70-410, except that a combination pen and ink reservoir is used instead of a stylus. Each 6.75

A 70-470

LEVER—Muscle. Similar to muscle lever No. A 70-460, except with provision for after-loading. Each 7.75

A 70-480

LEVER—Muscle. Similar to No. A 70-470, except with tubular support for use with muscle warmer. Each 8.25

A 70-490

COMBINATION PEN and RESERVOIR—For muscle levers, Nos. A 70-460, A 70-470, and A 70-480 3.00

A 70-500

COMBINATION PEN and RESERVOIR. For muscle levers, Nos. A 70-460, A 70-470 and A 74-480 including swivel..... 3.60

A 70-510

LEVER—Muscle, Horizontal Type, Ink Writing, With Pen. Similar in construction to heart lever No. A 70-320, except that it is more sturdily built. The attachment lever operates in the conventional vertical manner, and the direction of motion is changed by a double lever as in the heart lever. Provision is made for after-loading. The lever is insulated and a binding post is provided for electrical connection to the inductorium. The attachment clamp is built as an integral part of the frame 25.00

A 70-370

PEN—For muscle lever No. A 70-510, of stainless steel 3.00

A 70-520

LEVER—Isometric. Consists of a flat steel spring which clamps to a vertical rod and has a clamp on the other end for holding writing devices. Provision is made for various points of attachment along the spring, so that the amount of pull and the excursion can be adjusted. Specify for ink or smoked drum 5.00

A 70-530

MUSCLE WARMER—A jacketed and thermostatically controlled water bath, the cover of which supports an immersed glass cylinder. Using muscle levers Nos. A 70-480, A 70-430 and A 70-400, the muscle is suspended in the cylinder. The bath is controlled at 36°C., ±1°. Provision is made for changing solutions easily 20.00

A 70-540

MANOMETER—Mercury, Gravity Writing. An improved mercury manometer consisting of a glass U-tube, carefully selected for uniform inside diameter, mounted on a Monel metal backing with an integrally mounted support rod. The U-tube is easily removed for cleaning.

The manometer is so designed that it may be mounted at the same level as the kymograph drum. The stylus falls against the drum by gravity rather than spring tension and is so arranged that it is several centimeters below the mercury level. With this arrangement, the float and "wire" tend to remain centered rather than to fall to one side as with the conventional type manometer.

The float is concave to fit the mercury meniscus. The "wire" is stainless steel tubing, thus having greater rigidity for the same weight than solid wire. It protrudes through the bottom of the float several millimeters into the mercury. By this means the center of gravity is lowered, and the float tends to remain perfectly centered over the mercury.

Overall length is 32 cm. Pressures of over 250 mm. may be recorded without danger. Ample margin of safety is assured. (Mercury not included) 9.00

A 70-550

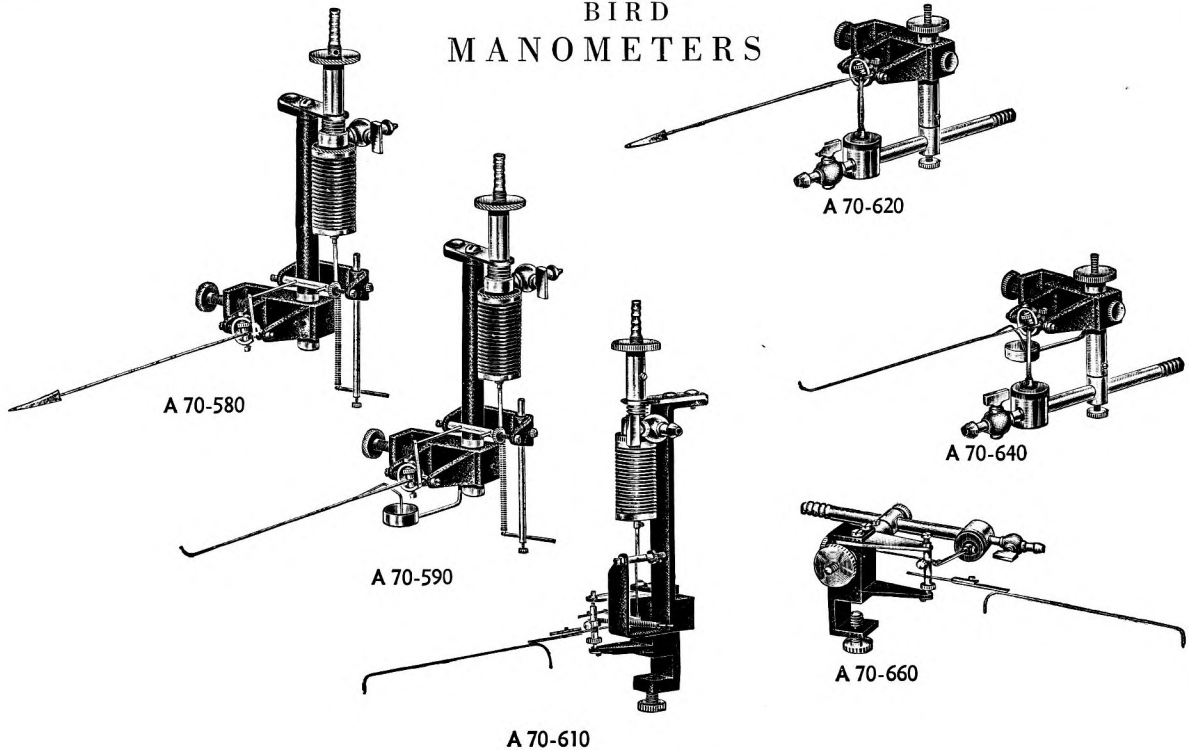
STYLUS—For mercury manometer No. A 70-540. Each75

A 70-560

MANOMETER—Mercury, Ink Writing. Similar to No. A 70-540, but a pen and ink reservoir replace the stylus. The pen, as above, falls against the drum by gravity, thus assuring the constant pressure necessary for ink recording. (Mercury not included) 12.00

A 70-570

PEN and INK RESERVOIR. For use with mercury manometer No. A 70-560 3.00

BIRD
MANOMETERS

A 70-580

MANOMETER—Metallic Bellows, With Gravity Writing Point. Has a phosphor-bronze bellows, 40 mm. long by 19 mm. diameter. As pressure increases, the bellows lengthens, its motion being magnified and transmitted to the pen. Response is linear with respect to pressure changes, thus giving a decided advantage not found with the membrane manometer. The inertia is very much less than that of a mercury manometer system. The fluid volume change per 10 mm. change in pressure is only 0.5 ml., so that bleeding of the animal under observation is held to a minimum.

The ratio of pen travel to change in pressure at maximum sensitivity is 0.5 cm. for 1 cm. of mercury change in pressure.

The bellows is easily removed for cleaning, or replacement. Micrometer adjustment of base line is obtainable by means of a knurled screw. A valve is inserted in the bellows line for bleeding off the air when the line is being filled with fluid. The clamp is built as an integral part of the frame of the instrument. 22.00

A 70-330

STYLUS—For manometer No. A 70-580.40
Lots of 12, 30% discount.

A 70-590

MANOMETER—Metallic Bellows, Ink Writing With Pen. Similar to manometer No. A 70-580 except that an ink reservoir is provided for attachment to the frame of the instrument and a pen is provided instead of a stylus.

The gravity type pen is of stainless steel tubing through which ink flows by capillarity. One tip rests against the drum; the other dips below the ink surface in the reservoir, thus eliminating the inertia of the ink supply and reservoir. 25.00

A 70-600

PEN—For metallic bellows manometer No. A 70-590. 3.00

A 70-610

MANOMETER—Metallic Bellows, Horizontal Type, Ink Writing, With Pen. Similar to metallic bellows manometer No. A 70-580 except that it is a horizontal pattern for use with kymograph No. A 70-140. 25.00

A 70-620

MANOMETER—Membrane, With Gravity Writing Point. Similar to No. A 70-690 research tambour except that the diaphragm diameter is reduced to $\frac{5}{8}$ inch, and a stopcock is provided on the bowl for bleeding air from the line when the instrument is being set up. The adjustments for base line and amplification are the same as those on No. A 70-690 tambour. 15.00

A 70-630

STYLUS—For manometer No. A 70-620.40

A 70-640

MANOMETER—Membrane, Ink Writing, With Pen. Identical with manometer No. A 70-620, except that an ink reservoir is provided for attaching to the instrument, and a pen is provided instead of the stylus. The pen operates in the same fashion as that described under No. A 70-690 research air tambour. 18.00

A 70-650

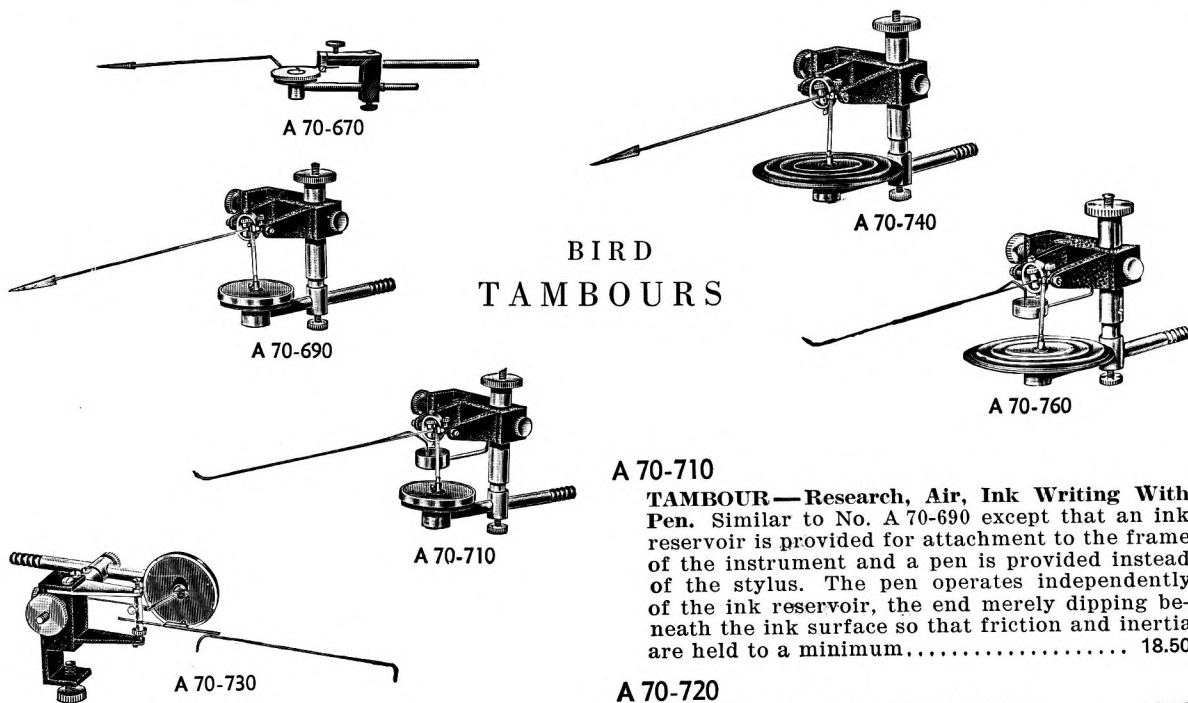
PEN—For manometer No. A 70-640. 3.00

A 70-660

MANOMETER—Membrane, Horizontal. Similar in design to the vertical membrane manometer No. A 70-640, but has been altered for use with the Continuous Feed Kymograph only. It is provided with a stainless steel capillary pen. 20.00

A 70-370

PEN—For No. A 70-610 and No. A 70-660 manometer. 3.00



BIRD
TAMBOURS

A 70-670

TAMBOUR—Student, Air, With Stylus. A simplified design providing maximum rigidity. A spring and screw adjusts the base line of the writing lever. Amplification adjustment of the diaphragm motion is obtained by sliding the tube carrying the bowl in its clamp. The diaphragm rubber is held in place on the tambour bowl by a metal ring. The entire bowl is removable from the instrument for replacement of the diaphragm.
Each 3.00

A 70-680

STYLUS—For student tambour No. A 70-670.. .40
Lots of 12, 30% discount

A 70-690

TAMBOUR—Research, Air, With Gravity Writing Point. A simple air tambour provided with all of the features required for serious work. The attachment clamp is built as an integral part of the frame. Micrometer adjustment of the base line is provided and the levers are so arranged that the sensitivity can be easily adjusted.

The diaphragm is secured to the bowl by means of a ring, and the link is attached to the diaphragm itself by a screw clamp. This eliminates all cementing. Furthermore, such attachment of the diaphragm to the writing system forces the writing lever to follow the motions of the diaphragm accurately. A further advantage of this method of attachment is that it allows for adjustment of damping by means of a pinchcock in the tambour line.

Extreme simplicity of the amplification lever system makes this tambour highly sensitive and easy to maintain 15.00

A 70-700

WRITING POINT—Tambour, Research, Air.
For No. A 70-69040
Lots of 12, 30% discount

A 70-710

TAMBOUR—Research, Air, Ink Writing With Pen. Similar to No. A 70-690 except that an ink reservoir is provided for attachment to the frame of the instrument and a pen is provided instead of the stylus. The pen operates independently of the ink reservoir, the end merely dipping beneath the ink surface so that friction and inertia are held to a minimum..... 18.50

A 70-720

PEN—For tambour No. A 70-710..... 3.00

A 70-730

TAMBOUR—Research, Air, Horizontal Type, Ink Writing, With Pen. Similar in design to vertical research tambour No. A 70-710, but altered for use with Bird Continuous Feed Kymograph only. The pen pressure against the paper is obtained by a small phosphor-bronze spring adjustable by a small screw. The pen, of stainless steel capillary tubing, is easily cleaned, does not tend to clog.

The lever system and the connection of the diaphragm to the tambour are the same as already described for our research tambour No. A 70-690. The mounting clamp is built as an integral part of the frame.
Each 20.00

A 70-370

PEN—Stainless Steel. For use with research tambour No. A 70-730 3.00

A 70-740

TAMBOUR—Air, Metallic Diaphragm, Gravity Writing. Similar to No. A 70-690 tambour except that the bowl and rubber diaphragm unit is replaced by a metallic diaphragm. This instrument, used in conjunction with pneumograph No. A 70-930 is sufficiently sensitive for making all normal respiration records. The advantage of the metallic diaphragm is that it never requires replacement unless it is deliberately damaged mechanically or overstressed by excess pressure.
Each 20.00

A 70-750

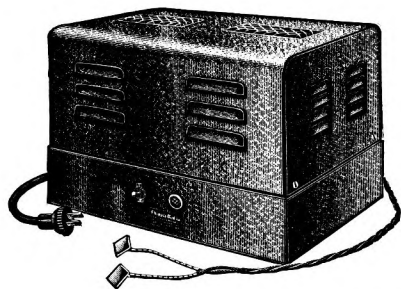
STYLUS—For No. A 70-740 tambour..... .40

A 70-760

TAMBOUR—Air, Metallic Diaphragm, Ink Writing. Similar to No. A 70-740 tambour except that it is equipped with the same pen and stationary reservoir which is furnished with No. A 70-710 tambour 23.00

A 70-770

PEN—For No. A 70-760 tambour..... 3.00



A 70-780
Cardi tachometer

A 70-780

CARDIOTACHOMETER — Parmenter-McLean. This instrument consists of an amplifier, peaked at 25 cycles, and is operated from small electrodes about the size of a dime, fastened with collodion to the sternum. With the electrodes tightly in place, violent physical action can take place without being reflected to the output in the form of muscle potentials. A relay in the output circuit serves to operate a signal magnet on the kymograph and to furnish a record of heart rate. Therefore, the instrument gives a continuous record of the pulse during conditioned stimulation, and the amplifier filters out everything except the impulses desired.. 120.00

A 70-790

SIGNAL MAGNET—With Stylus. Coil is completely enclosed in a nickel plated, brass tube to eliminate difficulties from stray liquids. Instrument is so designed that several magnets may be clamped to the same rod when it is desired to make the time lines close together. Overall length 250 mm. by 15 mm. high. These magnets are made to operate up to frequencies including 60 pulses per second..... 4.75

A 70-800

STYLUS—For signal magnet. No. A 70-790.. .25
Lots of 12, 30% discount.

A 70-810

SIGNAL MAGNET—Ink Writing, With Pen. Similar to signal magnet No. A 70-790. The stylus is removed and the combination pen and ink reservoir is clamped to the armature..... 7.75

A 70-820

PEN—For signal magnet No. A 70-810.... 3.00

A 70-830

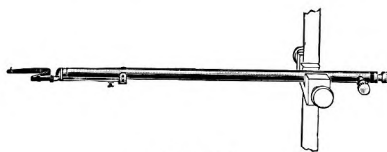
SIGNAL MAGNET—Horizontal Type (Shown in Phantom on No. A 70-140). This instrument is similar to signal magnet No. A 70-810, except that a pen, without attached reservoir, is furnished. This pen dips into the ink trough provided as standard equipment on the Bird Continuous Feed Kymograph No. A 70-140. Platform clamp No. A 70-270 is used to hold the signal magnet on the instrument platform of the kymograph 9.00

A 70-840

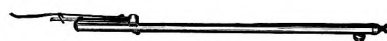
PEN—For signal magnet No. A 70-830.... 3.00

A 70-850

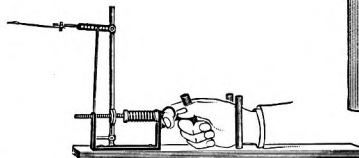
SIGNAL MAGNET—Horizontal Type. Same as A 70-830, but without clamp..... 7.75



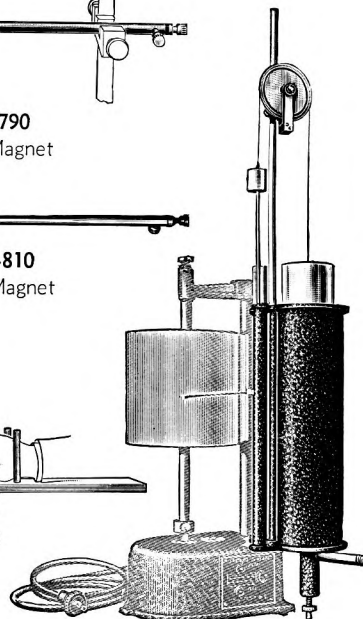
A 70-790
Signal Magnet



A 70-810
Signal Magnet



A 70-880
Ergograph



A 70-860
Spirometer

A 70-860

SPIROMETER — Recording, Gravity Stylus. Made to fit on kymographs, Nos. A 70-060 and A 70-070. The bell is 3 inches in diameter and is capable of an excursion of 10 inches. The stylus is driven by a cord which runs over a pulley, mounted on anti-friction rollers, from the bell to the stylus carrier and counterweight assembly. This construction results in an extremely sensitive and friction-free instrument.. 40.00

A 70-550

STYLUS—For No. A 70-860 spirometer.... .75

A 70-870

SPIROMETER—Recording, Ink Writing, With Pen. Similar to No. A 70-860 except that the stylus is replaced by a pen..... 43.00

A 70-570

PEN—With Attached Reservoir. For No. A 70-870 spirometer..... 3.00

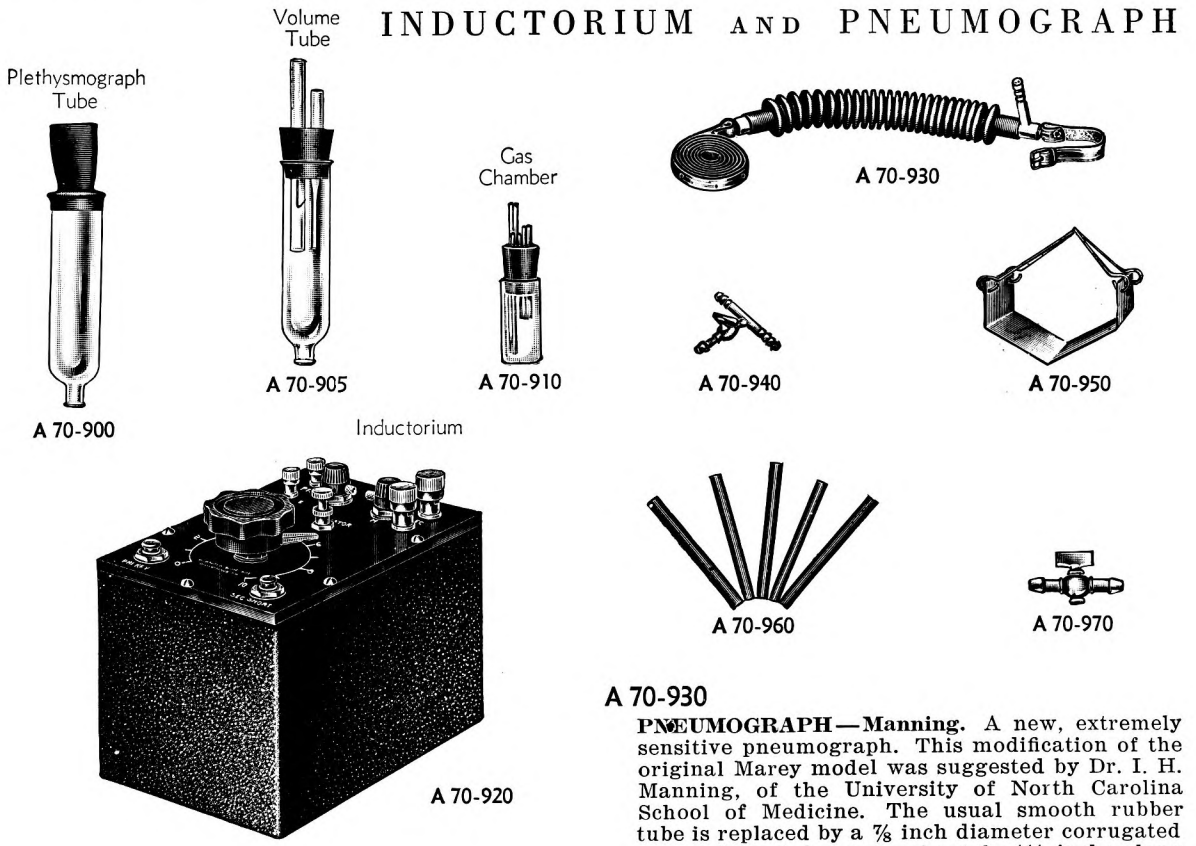
A 70-880

ERGOGRAF —For determining the fatigue curve from the pull of the index or second fingers of the right hand, operating against an adjustable coil spring. This piece of apparatus is completely self-contained and may be used in connection with either No. A 70-060 or No. A 70-070 kymograph. Full adjustment is provided for stroke and spring tension. A hand grip and two pins to restrain the position of the wrist of the subject are integral parts of the apparatus. These prevent the tendency of the subject to bring into action muscles other than those under test, thus the validity of the fatigue curve is maintained 15.00

A 70-890

ERGOGRAF —Similar to ergograph No. A 70-880 except that it is equipped for ink writing.. 18.00

INDUCTORIUM AND PNEUMOGRAPH



A 70-900

TUBE—Plethysmograph. A glass tube carrying a rubber collar into which the middle finger may be held air tight. Glass tube may be used, also, to construct a volume tube50

A 70-905

VOLUME TUBE 1.00

A 70-910

GAS CHAMBER—Consists of a glass vial with two small holes near the bottom. There are two stimulating electrodes and two glass tubes, one to admit the gas and the other to permit its escape65

A 70-920

INDUCTORIUM—Resistance Control. Offers a simpler and more convenient control than does the usual sliding coil type. All the elements are housed in a metal case with a bakelite panel. Binding posts are provided for electrical connections.

The primary control switch has three positions; (1) for continuous vibrator operations, (2) for vibrator operation when the key is pressed, (3) for key operation to produce single shocks. The secondary shorting key is built into the inductorium.

A 3-position switch in the secondary circuit is for three potential ranges. A knob controls the output voltage for any given range. Operation is from one dry cell battery 16.50

A 70-930

PNEUMOGRAPH—Manning. A new, extremely sensitive pneumograph. This modification of the original Marey model was suggested by Dr. I. H. Manning, of the University of North Carolina School of Medicine. The usual smooth rubber tube is replaced by a 7/8 inch diameter corrugated gum rubber tube, approximately 4½ inches long when contracted.

The sensitivity of a pneumograph does not depend, as many suppose, upon the length of the rubber hose, but is a function of the change in volume with change in length. The corrugated rubber tube gives several times the change in volume with change in length that is obtained with ordinary Marey pneumograph.

Each pneumograph is equipped with a leather strap and buckle, holes in the strap being at short intervals throughout the entire length.

With this pneumograph excellent respiration records have been obtained from rabbits .. 6.00

A 70-940

PRESSURE RELIEF VALVE—Consists of a standard stopcock attached to the side of a tubing connector. It is used for the release of pressure from any given line in order to establish the zero of operation of pressure recording instruments 2.00

A 70-950

SCALE PAN—An aluminum bucket designed to be used with muscle levers. Capacity, 100 ten-gram weights35

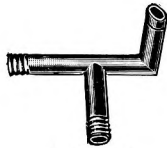
A 70-960

LEAD WEIGHTS—Ten Grams. For use with scale pan No. A 70-950 and muscle levers. Accuracy within 1%04

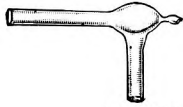
A 70-970

STOPCOCK—Brass, Nickel Plated. Bore diameter, approximately 3 mm. 1.25

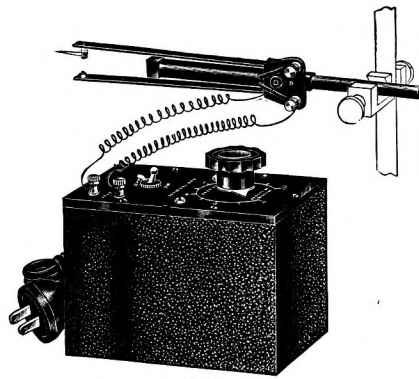
TUNING FORKS AND RECTIFIER



A 70-980
Cannula



A 71-020



A 71-050



A 71-060



A 71-070
Starter



A 71-080

A 70-980

CANNULA—6 mm. Bore. Built from a design developed at Johns-Hopkins University. It has large open passages for proper breathing of the animal through the portion inserted in the trachea. This cannula has a double outlet instead of slide valves. A rubber tube and pinch-cock on one of the outlets is for adjustment of the tambour excursion..... 1.00

A 70-990

CANNULA—8 mm. Bore. Otherwise the same as No. A 70-980..... 1.00

A 71-000

CANNULA—10 mm. Bore. Otherwise the same as No. A 70-980..... 1.00

A 71-010

CANNULA—12 mm. Bore. Otherwise the same as No. A 70-980..... 1.00

A 71-020

CANNULA—Arterial, 3-way. Made of glass, outside diameter at tip, 2 mm..... 1.00

A 71-030

CANNULA—Arterial, 3-way. Made of glass, outside diameter at tip 3.5 mm..... 1.00

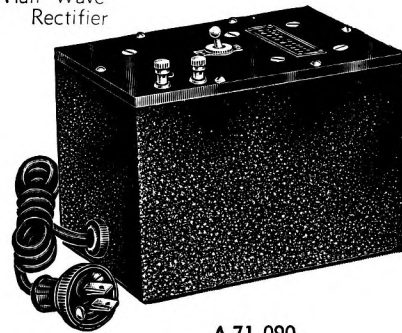
A 71-040

CANNULA—Arterial, 3-way. Made of glass, outside diameter at tip 5 mm..... 1.00

A 71-050

TUNING FORK—Electrically Driven. To avoid the difficulty usually experienced in maintaining electrically driven tuning forks in a state of proper repair, this new fork has been designed. It operates only on 110 volts, 60 cycles, A.C. A control box which is necessary to the operation of this fork is furnished. This consists of a neat metal case containing a switch transformer and volume control similar to that used in radio panels. This houses all the accessory apparatus necessary for operating synchronously driven tuning forks and controls the amplitude of vibrations. The forks make 60 vibration tracings per second instead of the usual 100. The coils are completely protected from laboratory solutions and all contacts are eliminated from the vibrating system..... 25.00

Half Wave
Rectifier



A 71-090

A 71-060

TUNING FORK—Filed until it gives 100 double vibrations per second. A writing point is provided. This fork serves to measure the latent period of muscular contraction and similar phenomena..... 2.25

A 71-070

TUNING FORK STARTER—Consists of a clip to hold the lips of the 100 v.p.s. tuning forks compressed until the clamp is pulled off at the instant vibration is to start. The sudden release of the compressed lips starts the forks..... .35

A 71-080

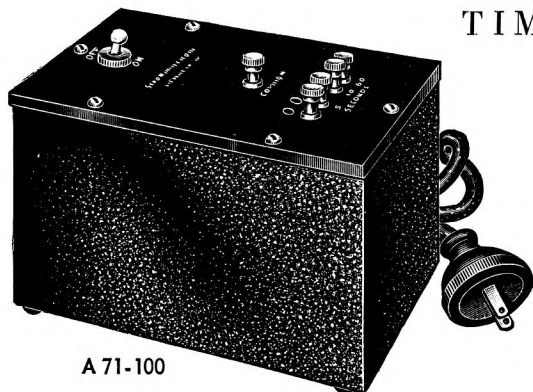
CAROTID PULSE CUP—Made of brass and properly proportioned to give sufficient area to transfer pulsation pressure to a tambour. The cup has a brass nipple corresponding to tambour connections..... 2.75

A 71-090

RECTIFIER—Used with signal magnets, Nos. A 70-790, A 70-810, or A 70-830, a record of 60 vibrations per second is obtained. This eliminates entirely the need for an electric tuning fork.

The rectifier consists of a transformer, a copper oxide rectifier, giving half wave rectification, binding posts for connection to the signal magnet, and cord and plug for attachment to the electrical outlet. It is housed in a baked enamel finish metal box, 4 1/16 x 6 x 4 inches in size. For 110 volts, 60 cycle, A.C. only..... 15.00

TIME MARKING CLOCKS



A 71-100



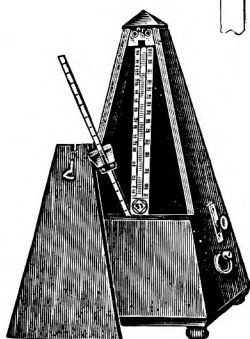
A 71-110



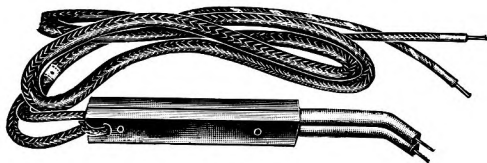
A 71-130



A 71-140



A 71-150



A 71-120

A 71-100

CLOCK—Time Marking, Synchronous Motor Drive. This instrument consists of a standard Warren Telechron Motor* geared to a set of contacts for the transmission of time intervals to various marking devices.

Four binding posts are provided for intervals of 1, 5, 10, and 60 seconds, with a common binding post for connection to the source of current. A single clock may be used to transmit any one, or all, of the intervals provided simultaneously.

The contacts are of silver and are designed for loads not to exceed 5 amperes at 3 volts. The motor is self-oiling and requires almost no attention. The assembly is housed in a metal box with a Bakelite panel. For operation on 110 volts, 60 cycle, A.C. only 30.00

**(Phipps & Bird, Inc., is licensed by the General Electric Co. for this application of the Warren Telechron Motor.)*

A 71-110

CLOCK—Time Marking, Laboratory Model. Similar to No. A 71-100 Time Marking Clock, except for the addition of a relay to increase the contact capacity and a selector switch for the choice of interval to be transmitted. The entire unit is housed in a baked enamel metal case, 4 x 6 x 4 1/16 inches. Binding posts are provided for the control circuit at low voltage, and a standard cord and plug for connection to the 110 volt, 60 cycle source. As the time is controlled from a Warren Telechron Motor, this unit is suitable for use only on 110 volt, 60 cycle circuits where ordinary electric clocks may be successfully operated. The relay provides a contact capacity of 30 amperes at low voltage such as that required for signal magnet operation 50.00
Extra for special voltage and frequency 10.00

A 71-120

ELECTRODES—Platinum. These stimulating electrodes have been designed to provide a maximum of ease of operation while protecting all metal portions except the platinum tips. The platinum tips can be replaced easily.
Per pair 2.25

A 71-130

PULLEY—Made of Bakelite with V-groove mounted on rod carrying a brass yoke with pointed pivot screws 2.00

A 71-140

PULLEY—A small, ball-bearing pulley, especially designed for laboratory use. The pulley, 1 1/2 inches in diameter, is completely shrouded to prevent the cord slipping off. Furnished with two brackets, one a rod for mounting on a ring-stand, the other for wall mounting 9.00

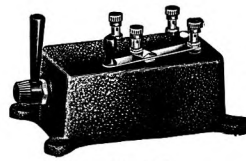
A 71-150

METRONOME—Simple Type. For those requiring an interrupter that can be adjusted from about 40-200 contacts per minute, this metronome is a good, reliable American make upon which double mercury contacts are fitted.. 9.00



Perimeter

A 71-160

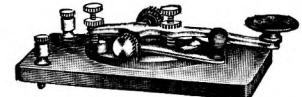


A 71-170



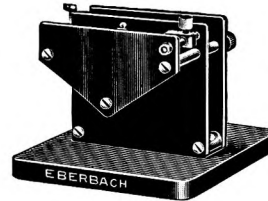
A 71-180

Keys



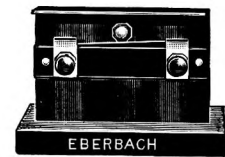
A 71-190

Pole Changing Switch



A 71-200

Electric Contactors



A 71-220

A 71-160

PERIMETER—Has a broad metal arc, revolving chart, holder and the sight hole through the center of rotation. The moving object carrier is adapted to hold any of the five test objects, 5 mm. in size, in red, green, blue, yellow and white or a sixth white button 10 mm. in size. The perimeter is furnished complete with 50 pairs of charts..... 50.00

A 71-170

SWITCH—Pole Changer. Consists of a double pole, double throw cam switch, mounted in a cast aluminum box, with feet for permanent attachment when desired. Four binding posts are provided and are so wired that the current supplied to any piece of the apparatus through the switch may be reversed by throwing the switch from one side to the other. A short circuiting key is provided on one pair of binding posts. By utilizing only one pole of the switch, it can be used as a simple switch as well as a pole changer. Each 6.00

A 71-180

KEY—Simple. A simple, inexpensive, but high grade key, built in accordance with standard telegraph practice. Keys of this type are capable of remarkably sharp, clean contact and are, therefore, suitable for all circuits where momentary closures of the contacts are desired.... 1.50

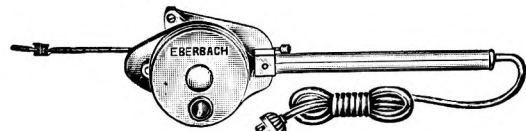
A 71-190

KEY—With Short Circuiting Switch. Similar to No. A 71-180. It possesses all the advantages outlined for simple key No. A 71-180 and, in addition, carries a short circuiting switch so that continuous pressure is not necessary to hold the circuit closed..... 2.25

A 71-200

ELECTRIC CONTACTOR—Intervals of 1/5, 1, 3 or 6 seconds may be obtained for operating electric time markers. A self-starting synchronous electric motor is used to obtain accurate intervals. The unit is mounted on an iron base 4 1/2 by 4 1/2 inches. A connecting cord, with switch and plug, is included. For operation with 110 volt 60 cycle current..... 27.50

Graphic Timer



A 71-210

A 71-210

TIMER—Graphic. This direct writing instrument records 1/5 or 1 second intervals. A self-starting synchronous electric motor, which is an integral mechanical part of the apparatus, is used to obtain accurate intervals. Overall length is 9 inches. Connecting cord, with switch and plug, is included. For operation with 110 volt, 60 cycle current..... 16.00

A 71-220

ELECTRIC CONTACTOR—This apparatus makes contact every 1/5 second, for use with electric time markers. It is driven by a self-starting synchronous electric motor. The unit is mounted on an iron base 3 x 5 inches. A connecting cord, with switch and plug, is included. For operation with 110 volt 60 cycle current. Each 10.00

A 71-230

ELECTRIC CONTACTOR—Identical with No. A 71-220, but with contact interval of 1 second. Each 9.00

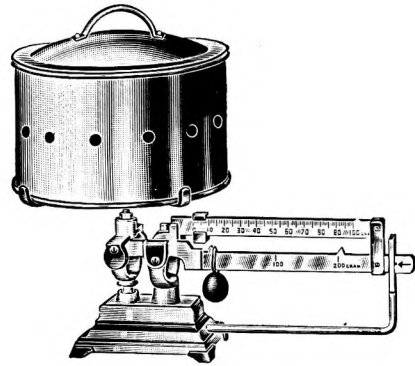
Note: Nos. A 71-200, A 71-210, A 71-220, and A 71-230 can be furnished on special order to operate on 50 or 25 cycle 110 volt current and also 220 volt, 60, 50, and 25 cycle current.

ANIMAL ACCESSORIES

A 1-200

ANIMAL BALANCES—For Weighing Small Animals. These balances are of beam construction and are much superior to the spring type. The small 110 gram size has one beam graduated by .1 gram with extra hanging weight to the capacity of 110 grams. The balances incorporate a perforated aluminum box, steel knife edges, agate bearings, and leveling screws.

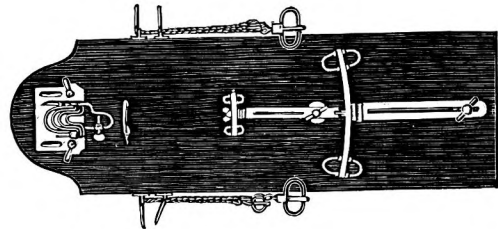
| | | | |
|--------------------------|-------|-------|-------|
| Capacity, grams | 110 | 500 | 1000 |
| Sensitivity, grams | 0.1 | 0.5 | 1 |
| Upper beam, to grams | | 50 | 100 |
| Subdivisions, grams | | 0.1 | 1 |
| Lower beam, to grams | | 450 | 900 |
| Subdivision, grams | | 50 | 100 |
| Box size, height, inches | 3 | 5 | 5 |
| Box size, diam., inches | 3-1/2 | 9 | 9 |
| Each | 11.00 | 21.00 | 21.00 |



A 1-200
Animal Balance

A 1-210

ANIMAL BOARD—Latapie, Eberbach. For rabbits, guinea pigs, cats, etc. Consists of a selected polished hardwood table 34 inches long, 11 inches wide and 7/8 inch thick. The table is mounted on four iron supports 3 1/2 inches high. The complete set of clamps and holders are automatic and fully adjustable; they are systematically arranged for added convenience and made of brass, nickel plated. The clamps are of an improved design and produce a positive grip to firmly hold the leg of the animal in the desired position. The assortment of adjustable holders for nose and head is complete and of sufficient variety for almost any size or shape in the small animal group. (Eberbach #PY-10)..... 50.00



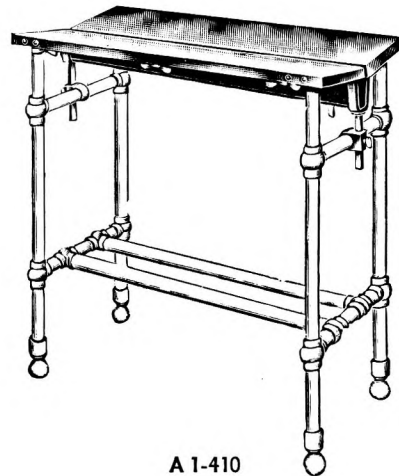
A 1-210
Animal Board

ANIMAL TABLES

A 1-410

ANIMAL TABLES—Surgical. For use with dogs, monkeys or smaller animals. The top is stainless steel and adjustable to three positions including flat, and two different angles for drainage to the center. The stand is made of heavy pipe and finished in white lacquer enamel. A removable drain pan is under the center. Cleats are provided for tying the animal.

| | | |
|----------------|-------|-------|
| Size | A | B |
| Length, inches | 40 | 48 |
| Width, inches | 20 | 24 |
| Height, inches | 40 | 40 |
| Each | 82.50 | 93.50 |

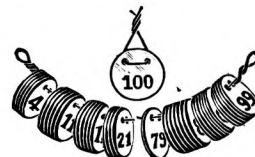


A 1-410

A 1-420

ANIMAL TAGS—Aluminum, 1/2 inch. For attachment to the ears of animals by means of small Monel metal staples, No. A 1-430. The tags are numbered consecutively from 1 to 100. Complete with staples. Sold only in sets numbered from 1 to 100.

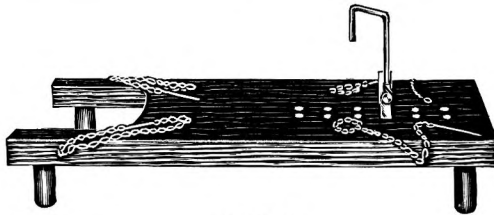
Per Set..... 2.20



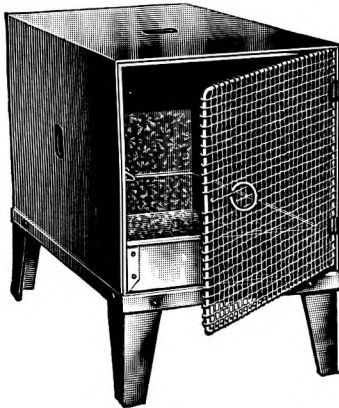
A 1-420

A 1-430

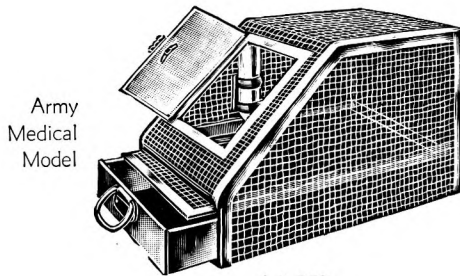
STAPLES—Monel Metal. For use with No. A 1-420 animal tags. Per 100..... .70



A 1-220

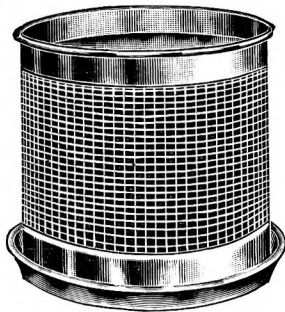


Phipps
Institute
Model
A 1-240
A 1-250



Army
Medical
Model

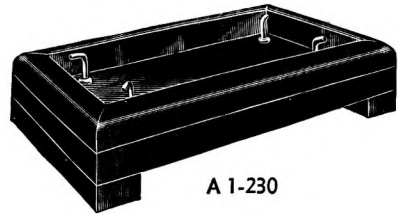
A 1-260



A 1-270
Removable
Top

A 1-220

ANIMAL BOARD—Simplified Pattern. For cats, rabbits, guinea pigs, etc. The table is of selected wood, filled to prevent moisture absorption and carefully finished to lend added appearance and utility. The table is 16 inches long, 8 inches wide and cut back 4 inches to facilitate manipulation with the animal. Mounted on 4 wooden legs 2 inches high. The clamps are completely adjustable and of simple chain design but positive in their action. The adjustable head holder is made of nickel plated brass and can be moved into various positions to accommodate different sized animals (Eberbach #PY-11)..... 12.50



A 1-230

A 1-230

ANIMAL BOARDS—Dissecting, Simple Form. Made of hardwood, finished in black asphaltum paint, screw assembled, and with four brass fastening hooks for fastening the legs of the animal. The dissecting board has a wood molding 1 inch high. Suitable for guinea pigs, rabbits, cats, rats and small dogs.

| Size | A | B |
|------------------------|------|------|
| Length, inside, inches | 11 | 24 |
| Width, inside, inches | 6 | 10 |
| Each | 4.40 | 6.60 |

ANIMAL CAGES

A 1-240

ANIMAL CAGE—Phipps Institute Model. As designed by Dr. Paul A. Lewis. The body of this cage is made of 24 gauge and the pan 22 gauge galvanized Armco iron. The door is made of 2 mesh, 14 gauge, wire cloth, galvanized after fabrication. Finished throughout with aluminum lacquer. The cages are provided with side, top and bottom perforations so they may be stacked and bolted together. Dimensions are 14 inches wide, 16 inches deep and 14 inches high. Single cage, only, without base..... 8.25

A 1-250

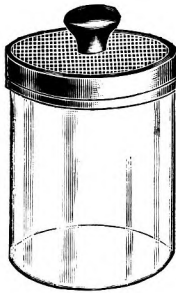
BASE, Only—Of Phipps Animal Cage. As illustrated with No. A 1-240. Made of heavy galvanized iron, aluminum lacquer finish. Height, 6¾ inches..... 2.40

A 1-260

ANIMAL CAGE—Army Medical School Model. For rats and other small animals. Made of wire cloth, 3 mesh, 18 gauge, galvanized after weaving and mounted in a frame of heavy galvanized rust-resisting Armco iron. The wire floor which holds the animal while the removable drawer is being cleaned, can also be removed for cleaning. The metal door is 5½ inches square, hinged and equipped with lock. Finished throughout with aluminum lacquer. Outside dimensions are 9 inches wide, 15 inches deep and 9 inches high. With tube holder but without drinking tube. For drinking tube, see No. A 1-340..... 5.25

A 1-270

ANIMAL CAGE—Round Form. For mice, rats and other small animals. The wire floor is permanently fastened to the cage and the construction is specially designed to prevent excreta from collecting anywhere except in the bottom pan. The sides and floor are 3 mesh, 18 gauge wire, galvanized after weaving. The top cover is removable. Dimensions of the cage are 8½ inches diameter by 9 inches high. The pan is 1 inch deep. Finished with aluminum lacquer. Water device No. A 1-340 is suitable for this cage... 2.20



Metal Cover and Pyrex Jar

A 1-280

A 1-280

ANIMAL CAGES— (Animal Jars), With Cover. For rats, mice, guinea pigs and other small animals. The jars are of heavy Pyrex Brand glass with walls 3/16 inch thick. These jars can, of course, be sterilized, either by hot air or steam. The open ends are finished with a fire polished bead to increase thermal and mechanical strength. The covers are heavy wire mesh, galvanized after weaving, 4 holes to an inch. The wire and rim are finished with aluminum lacquer and the knob is lacquered instrument olive.

| | | |
|--------------------------------|-------------|-------------|
| Size | A | B |
| Diam. of jar, inches | 6 | 8 1/4 |
| Height of jar, inches | 8 | 8 |
| Capacity of jar, gallons | 1 | 1 1/4 |
| Each | 3.50 | 4.25 |

A 1-290

ANIMAL JARS— Pyrex Brand Glass. This is the Pyrex jar only of No. A 1-280 and as described under that number. (Corning #830)

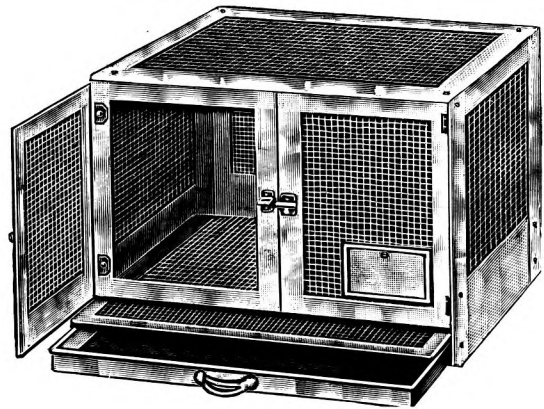
| | | |
|-------------------------------|--------------|--------------|
| Size | A | B |
| Diam. of jar, inches | 6 | 8 1/4 |
| Height of jar, inches | 8 | 8 |
| Capacity of jar, gallons..... | 3/4 | 1 1/4 |
| Quantity in case | 8 | 6 |
| Each | 1.90 | 2.90 |
| Per case | 13.68 | 15.66 |

A 1-300

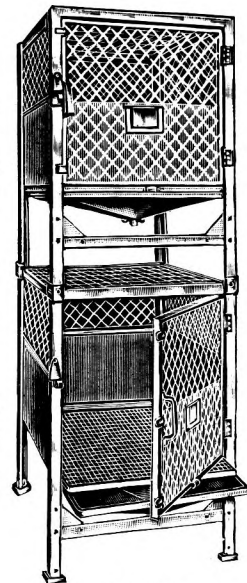
ANIMAL CAGE— For cats, rabbits or rats. Made of galvanized Armco iron and wire cloth, 3 mesh, 18 gauge, galvanized after weaving. These cages have wire floors sliding above the removable pan and are supported above the pan on angle runners attached to the side of the cage. Finished with aluminum lacquer. Dimensions are 22 inches wide, 20 inches deep and 15 inches high. Complete with card holder..... 15.40

A 1-310

ANIMAL CAGES—Large Size. For dogs and monkeys. The cages are made of 1 1/4 inch hot galvanized angle and 20 gauge galvanized Armco iron. Panels are of a single piece of 9 gauge steel perforated with 1 1/2 inch diamond shaped openings. The perforated steel is welded into angle iron frames and hot galvanized after fabrication. The floor of the cage is constructed of the same perforated steel, except the perforations are 3/4 inch, and the material is welded into a 3/8 inch rod frame, hot galvanized after fabrication. The floor of the cage and metabolism funnel shaped pan slide on separate galvanized angle iron runners. The floor is held in place by a hinged catch attached to the door. Cage is mounted on galvanized cast iron "Easy-Glide" shoes and can be stacked, one over another, in tiers, as illustrated, or used separately. Finished



A 1-300



For Single Unit Cages See A 1-320

Large Size For Dogs and Monkeys

A 1-310

See also A 1-320

with aluminum lacquer and furnished with card holder.

| | | |
|------------------------------|----------|----------|
| Size | A | B |
| Number of cages | 2 | 2 |
| Width, inside, inches | 24 | 28 |
| Height, inside, inches | 24 | 28 |
| Depth, inside, inches | 32 | 34 |

Complete unit (2 cages).....110.00 126.00

A 1-320

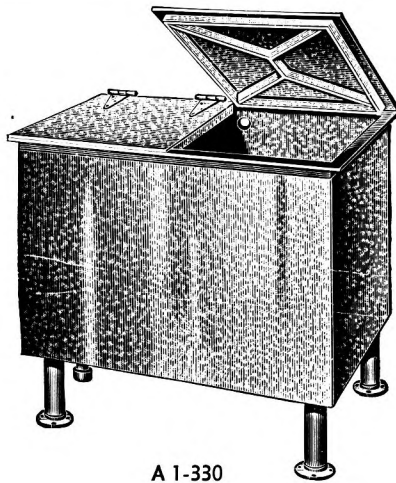
ANIMAL CAGES—Large Size. For dogs and monkeys. Under this number the individual cages are listed which constitute the complete units illustrated and described under No. A 1-310. The cages can be used separately or stacked, one over another, in tiers, as illustrated under No. A 1-310.

| | | |
|------------------------------|----------|----------|
| Size | A | B |
| Width, inside, inches | 24 | 28 |
| Height, inside, inches | 24 | 28 |
| Depth, inside, inches | 32 | 34 |

Each

| | | |
|--|--------------|--------------|
| | 55.00 | 63.00 |
|--|--------------|--------------|

Sterilizer
For Animals
or
Cages



A 1-330

A 1-330

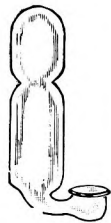
ANIMAL CAGE STERILIZERS—Suitable either for animals or cages. Made of heavy galvanized 16 gauge iron for the smaller size, and 10 gauge for the larger size. Both sizes are heavily braced to prevent bulging. Covers are hinged and fit tightly when closed. They may be heated with a suitable steam coil in the bottom. Bottoms of the tanks are made to slope toward the center drain, which is provided with a shut-off valve. Finished with aluminum lacquer.

| Size | A | B |
|----------------------|----|----|
| Length, inches | 36 | 48 |
| Width, inches | 24 | 36 |
| Depth, inches | 24 | 36 |

Each 72.00 150.00

A 1-340

ANIMAL DRINKING TUBE—McCollum. Specially designed for use in animal cage No. A 1-240 (page 8) but may be used in any cage for small animals. Indentations are provided in the upper section of the tube for wiring to the side of the cage60



A 1-340

Glass
Drinking
Tubes



A 1-350

A 1-350

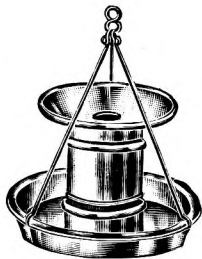
ANIMAL DRINKING TUBE—Rochester Medical School Model. Similar to No. A 1-340, but without bottom cup. This design reduces the possibility of contamination..... .40

A 1-360

ANIMAL FOOD CUP—McCollum. Particularly suitable for feeding rats and for food experiments. Made of tin, fastens to the top of the cage and is easily taken apart for cleaning.

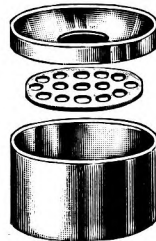
| Size, inches | 6 | 9 |
|----------------------------|----|----|
| Diam. of cup, inches | 2¾ | 3½ |
| Depth of cup, inches | 2 | 2½ |

Each55 .77



A 1-360

Feeding
Cups



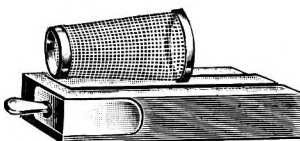
A 1-370

A 1-370

ANIMAL FOOD CUP—Aluminum Body With Cover and Disc of Monel Metal. The perforated disc rests on the food, thus preventing scattering and digging by the animal. The aluminum food container is 3½ inches diameter by 1½ inches deep; the hole in the cover is 1¼ inches diameter 1.10

A 1-380

ANIMAL HOLDER—Baltimore Health Department Model. For mice. The cage is made of Monel metal wire, both ends open, and mounted on a Monel metal base. The holder is reversible and has a slot in upper part of wire for inoculation. The base is 4 inches long and 2½ inches wide. Complete with adjustable tail clamp.. 3.30



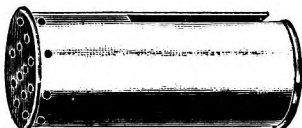
A 1-380

A 1-390

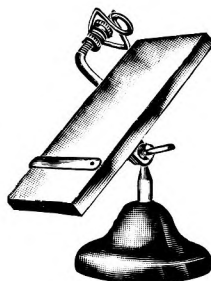
ANIMAL HOLDERS—Voge. For guinea pigs. Made of zinc, perforated at the end for ventilation, and with slot for insertion of instruments.

| Size | A | B |
|----------------------|----|----|
| Diam., inches | 2½ | 3½ |
| Length, inches | 7 | 8 |

Each 1.15 1.45



A 1-390



A 1-400

A 1-400

ANIMAL HOLDER—Kitasato. Made of Monel metal with attachments of brass, nickel plated. The stand is cast iron, lacquered. The plate is adjustable to any position. The plate is 7 inches long and 3½ inches wide..... 10.50

DISSECTING FORCEPS



A 29-710



A 29-720



A 29-730



A 29-740



A 29-750



A 29-760



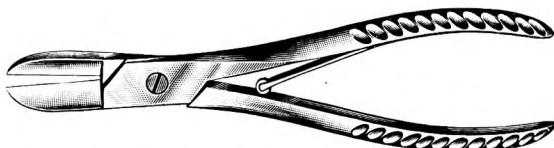
A 29-770



A 29-780



A 29-790



A 29-800

A 29-710

DISSECTING FORCEPS — Straight, Fine, Corrugated Points. Made of steel nickel plated and polished with serrated grip, guide pin, and file cut needle sharp points. Length, 115 mm.... .40

A 29-720

DISSECTING FORCEPS — Straight, Medium, Corrugated Tips. Made of steel nickel plated and polished with serrated grip, guide pin, and file cut medium sharp points. Length, 115 mm... .45

A 29-730

DISSECTING FORCEPS — Student Grade, Straight, Fine, Corrugated Tips. Made of steel nickel plated with serrated grips and fine points. Length, 115 mm..... .18

A 29-740

DISSECTING FORCEPS — Curved, Fine, Corrugated Tips, Full Grip. Made of steel nickel plated and polished with full serrated grip, guide pin, and file cut points. Length, 115 mm..... .45

A 29-750

DISSECTING FORCEPS — Straight, Blunt, Corrugated Tips. Made of steel nickel plated and polished with uniform round file cut tips and heavily serrated grip. Length, 120 mm..... .45

A 29-760

DISSECTING FORCEPS — Straight, Blunt, Deeply Corrugated Tips. Made of steel nickel plated and polished with uniformly round deep file cut tips, guide pin, and full length serrated grip.

| | | |
|------------------|-----|-----|
| Length, mm. | 115 | 140 |
| Each | .45 | .55 |

A 29-770

DISSECTING FORCEPS — Straight, Blunt Corrugated Tips, Chicago Type. Made of steel nickel plated and polished with spread shoulders to prevent separation of the tips under heavy pressure. Length, 130 mm..... .90

A 29-780

DISSECTING FORCEPS — Tissue, Straight, Mouse Tooth Tips. Made of steel nickel plated and polished with sharp prong teeth and serrated grip.

| | | |
|------------------|-----|------|
| Length, mm. | 115 | 140 |
| Each | .90 | 1.10 |

A 29-790

DISSECTING FORCEPS — Straight, Fine, Smooth Tapered Tips. Made of steel nickel plated and polished without corrugations on the tips or serrations on the grips. Length, 120 mm. Each

| | |
|-------|-----|
| | .20 |
|-------|-----|

A 29-800

DISSECTING FORCEPS — Bone Cutting. Made of steel nickel plated and polished with self opening spring, screw lock, and slightly curved blades. Length, 200 mm..... 3.50

A 29-810
DISSECTING FORCEPS — Artery Clamp, Straight, Dieffenbach. Made of steel nickel plated and polished with file cut corrugated tips and serrated grips. Length, 56 mm..... 1.10

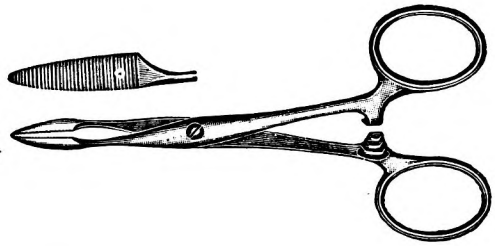


A 29-810



A 29-820

A 29-820
DISSECTING FORCEPS—Artery Clamp, Curved, Dieffenbach. Made of steel nickel plated and polished with file cut corrugated tips and serrated grips. Length, 56 mm.
 Each 1.10



A 29-830

A 29-830
DISSECTING FORCEPS—Artery, Pean's. Made of steel chromium plated with file cut corrugated tips and screw lock. Length, 125 mm..... 2.25

A 29-840
DISSECTING HOOKS AND CHAINS—Made of steel nickel plated. Length, 150 mm..... .30



A 29-840

A 29-850
DISSECTING BLOW PIPE—Anatomical, Plain, Tapered. Made of brass nickel plated. Length 140 mm.20



A 29-850

A 29-860
DISSECTING BLOW PIPE — Anatomical, Tapered, With Wood Mouthpiece. Made of brass nickel plated. Length, 150 mm..... .25



A 29-860

DISSECTING KNIVES

A 29-870
DISSECTING KNIFE—Brain. Made of steel with nickel plated handle. The blade is flat, polished, flexible, and sharp on both edges. Length of blade, 175 mm.
 Each 6.00



A 29-870

A 29-880
DISSECTING KNIFE — Cartilage, All Metal. Made entirely of steel with curved cutting edge and fully serrated handle. Length of blade, 50 mm.; total length, 160 mm.
 Each60

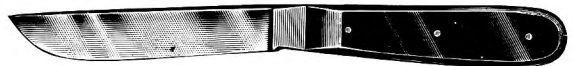


A 29-880

A 29-890
DISSECTING KNIVES—Cartilage. The blades are of steel, heavily constructed, with substantial handle.

| | | |
|--------------------------|-----|-----|
| Total length, mm..... | 170 | 190 |
| Length of blade, mm..... | 56 | 90 |

 Each 1.75 1.85



A 29-890

A 29-900
DISSECTING KNIFE and NEEDLE—Seeker and Probe. Made of steel nickel plated with curved cutting edge on 1 end and straight sharp point on the other. Length, 150 mm..... 1.00



A 29-900

A 29-910
DISSECTING SCALPELS — All Metal. Made of steel nickel plated.

| | | |
|--------------------------|----|----|
| Length of blade, mm..... | 32 | 38 |
|--------------------------|----|----|

 Each60 .60



A 29-910

A 29-920
DISSECTING SCALPELS—Convex Cutting Edge. Made of high grade steel and substantial handle.

| | | | | |
|-------------------------|----|----|----|----|
| Length of blade, mm.... | 25 | 32 | 38 | 45 |
|-------------------------|----|----|----|----|

 Each50 .50 .50 .50



A 29-920



A 29-940



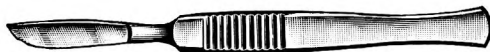
A 29-930



A 29-950



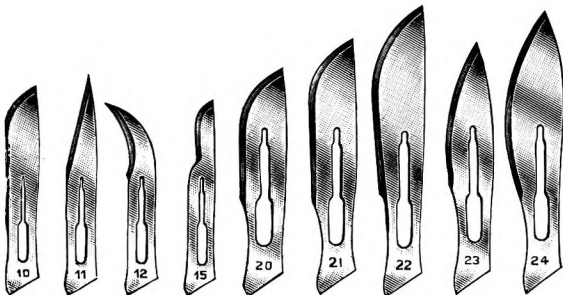
A 29-960



A 29-970



A 29-980



A 29-990

A 29-990

KNIFE BLADES—Detachable. For use with handles No. A 29-980. Made of finest steel with well honed edges. Blades Nos. 10, 11, 12 and 15 fit handles Nos. 3 and 7. Blades Nos. 20, 21, 22, 23 and 24 fit handle No. 4. Packed 6 blades of one style per package.

| | | | | | |
|-------------------------|-----|-----|-----|-----|----|
| Style No..... | 10 | 11 | 12 | 15 | 20 |
| Length of blade, mm.... | 27 | 20 | 17 | 12 | 27 |
| Takes handle, Nos..... | 3-7 | 3-7 | 3-7 | 3-7 | 4 |

Per package of 6..... .55 .55 .55 .55 .55

| | | | | |
|--------------------------|----|----|----|----|
| Style No..... | 21 | 22 | 23 | 24 |
| Length of blade, mm..... | 33 | 38 | 30 | 38 |
| Takes handle, No..... | 4 | 4 | 4 | 4 |

Per package of 6..... .55 .55 .55 .55

Detachable blades fit all standard handles—old or new.

A 29-930

DISSECTING SCALPEL—Oblique Cutting Edge. Made of high grade steel and substantial handle. Length of oblique cutting edge, 10 mm.; length of blade, 45 mm. Each..... 1.00

A 29-940

DISSECTING SCALPEL—Convex Cutting Edge, Pointed End. Made of high grade steel with substantial handle. Length of blade, 35 mm. 1.00

A 29-950

DISSECTING SCALPEL—Concave Cutting Edge, Blunt End. Made of high grade steel with substantial handle. Length of blade, 35 mm.... 1.00

A 29-960

DISSECTING SCALPEL—Convex Cutting Edge, Sharp End. Made of high grade steel with substantial handle. Length of blade, 35 mm.... 1.00

A 29-970

DISSECTING SCALPELS—All Metal, Convex Cutting Edge. Made of steel, nickel plated, with mat finish handle.

| | | | |
|--------------------------|------|------|------|
| Length of blade, mm..... | 25 | 38 | 45 |
| Each | 1.00 | 1.00 | 1.00 |

DETACHABLE BLADE KNIVES

SCALPELS—Dissecting and Operating

Simplest and easiest to work of all detachable blade knives. Handles are properly balanced for fine surgical or dissecting work. Blades are made of finest quality steel honed to razor edge, and once inserted the blade is as rigid as a permanent knife. Nine different style blades to fit all surgical handles—old or new.

Instructions for Use

Hold blade between thumb and forefinger of left hand, and handle in right hand. Insert large groove of blade into slit of handle, slide blade over button of handle and snap into place.

Nine different style blades for dissecting and operating.

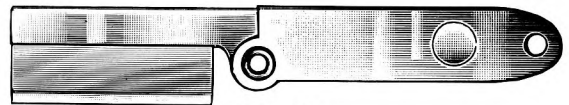
A 29-980

KNIFE HANDLES—Detachable. For use with blades as listed under No. A 29-990. Well balanced smooth finish with cross serrations at finger position.

| | | | |
|-----------------------------|------|------|------|
| Size No..... | 3 | 4 | 7 |
| Length, without blades, mm. | 125 | 125 | 160 |
| Each | .90 | .90 | .90 |
| Per dozen..... | 9.60 | 9.60 | 9.60 |

A 30-010

RAZOR BLADE POCKET KNIFE—Gits. Will take standard safety razor blade. Replaceable blade is easily inserted or changed. This knife allows the full length of the blade to be used. Opens and closes like a pen knife. Very flat to fit conveniently in the vest pocket. Excellent for field use by the botany student and for general use when a sharply honed knife is desirable. With blade.30
Per dozen 3.00



A 30-010

DISSECTING NEEDLES

A 30-020

DISSECTING NEEDLE—Straight, in Wood Handle, Student Grade. Made of steel, set in polished hard wood handle. Total length, 145 mm. Each05
Per dozen40



A 30-020

A 30-030

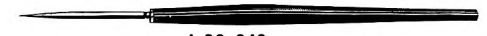
DISSECTING NEEDLE—Bent, in Wood Handle. The same as No. A 30-020, but with bent needle. Total length, 135 mm.05
Per dozen40



A 30-030

A 30-040

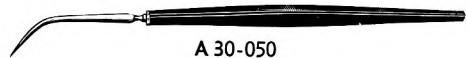
DISSECTING NEEDLE—Straight, in Ebony Handle. Made of high grade steel with shoulder and mounted in a polished ebony handle. Total length, 135 mm.50



A 30-040

A 30-050

DISSECTING NEEDLE—Curved, in Ebony Handle. The same as No. A 30-040, but with curved needle. Total length, 150 mm.55



A 30-050

A 30-060

DISSECTING NEEDLE—Half Spear Point, in Ebony Handle. The same as No. A 30-040, but with half spear point, cutting edge on one side. Total length, 130 mm.75



A 30-060

A 30-070

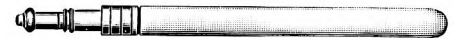
DISSECTING NEEDLE—Full Spear Point, in Ebony Handle. The same as No. A 30-040 but with full spear point, cutting edge on each side. Total length, 130 mm. Each90



A 30-070

A 30-080

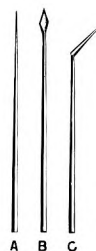
DISSECTING NEEDLE HANDLE—Bone. Made of bone with nickel plated metal chuck for holding No. A 30-100 needles. Length, 85 mm. Without needles.20



A 30-080

A 30-090

DISSECTING NEEDLE HANDLE—Metal. Made entirely of metal with adjustable chuck for holding No. A 30-100 needles. Length, 80 mm. Without needles.20



A 30-100

For Use with Either Handle A 30-080 or A 30-090



A 30-090

A 30-100

DISSECTING NEEDLES—Without Handles. For use with Nos. A 30-080 and A 30-090 handles.

| Style | A | B | C |
|-----------|----------|-------|-------------|
| Type | Straight | Spear | Obtuse Bent |
| Per dozen | .15 | .50 | .15 |

A 30-110

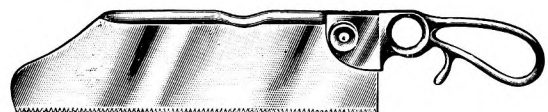
DISSECTING PROBE—Wilson or Mall. Made of nickel plated steel with slightly bent, blunt tip and octagonal mat finished handle. Length, 145 mm.35



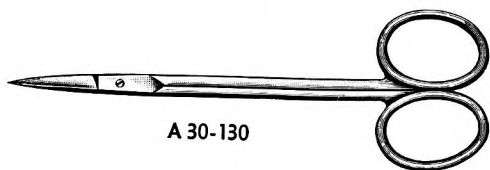
A 30-110

A 30-120

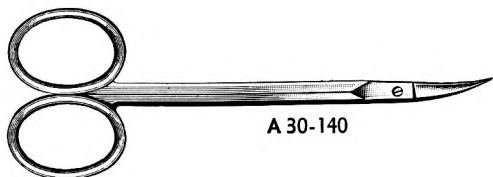
DISSECTING SAW—Bone. Made of steel nickel plated with removable handle equipped with finger grip. Total length, 290 mm.; length of blade, 200 mm.6.00



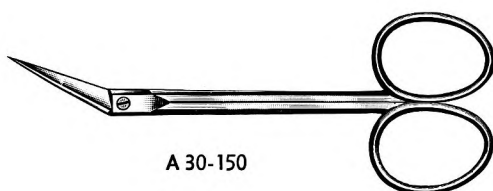
A 30-120



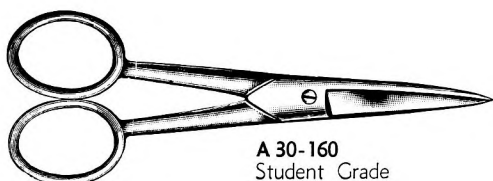
A 30-130



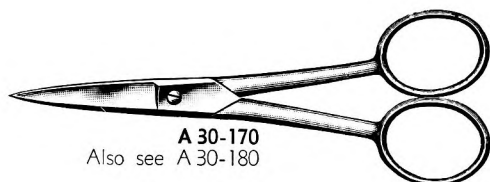
A 30-140



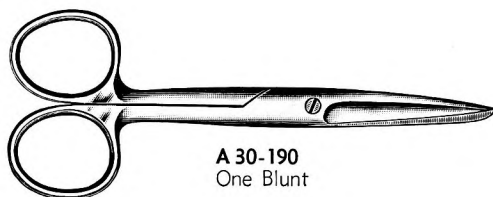
A 30-150



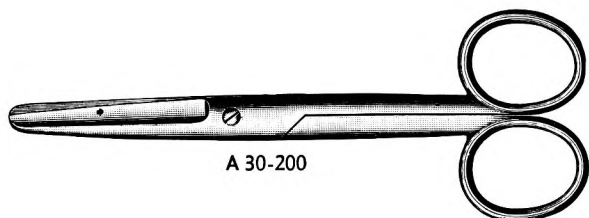
A 30-160
Student Grade



A 30-170
Also see A 30-180

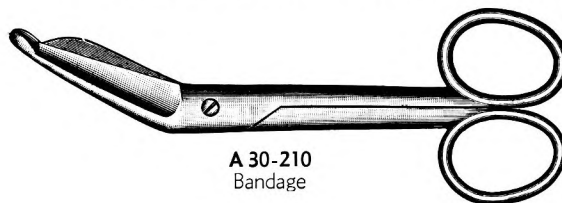


A 30-190
One Blunt



A 30-200

DISSECTING SCISSORS



A 30-210
Bandage

A 30-130

DISSECTING SCISSORS—Straight, Fine. Made of steel nickel plated and polished with screw lock. The blades are narrow and fine pointed. Total length, 110 mm. Length of blades, 25 mm. Each70

A 30-140

DISSECTING SCISSORS—Curved, Fine. Similar to No. A 30-130, but with curved blades. Total length, 115 mm.; length of blades, 25 mm... .80

A 30-150

DISSECTING SCISSORS—Angular, Fine. Similar to No. A 30-130, but with blades set at an angle. Total length, 115 mm.; length of blades, 25 mm. Each 1.25

A 30-160

DISSECTING SCISSORS—Student Grade, Heavy. Made of steel, nickel plated and polished with sharp pointed blades. Total length, 115 mm.; length of blades, 35 mm..... .35

A 30-170

DISSECTING SCISSORS—Laboratory Grade, Heavy. Made of steel, nickel plated and polished with screw lock. Length 155 mm..... .55

A 30-180

DISSECTING SCISSORS—Laboratory Grade, Light. Similar to No. A 30-170 in construction and quality but of lighter weight. Length, 115 mm. 1.10

A 30-190

DISSECTING SCISSORS—Laboratory Grade, Heavy, One Sharp and One Blunt Point. Made of steel, nickel plated and polished with screw lock.

| | | |
|--------------------------|-----|-----|
| Length, mm..... | 115 | 140 |
| Length of blade, mm..... | 38 | 50 |

| | | |
|------------|------|------|
| Each | 1.20 | 1.35 |
|------------|------|------|

A 30-200

DISSECTING SCISSORS—Laboratory Grade, Heavy, Blunt Points. Similar to No. A 30-190 but with blunt tips on both blades.

| | | |
|--------------------------|-----|-----|
| Length, mm..... | 115 | 140 |
| Length of blade, mm..... | 38 | 50 |

| | | |
|------------|------|------|
| Each | 1.20 | 1.35 |
|------------|------|------|

A 30-210

BANDAGE SCISSORS—Utility. Made of steel, nickel plated and polished with blades set at an angle and with knob on lower blade.

| | | |
|-----------------|------|------|
| Length, mm..... | 140 | 180 |
| Each | 1.50 | 2.00 |

SECTION LIFTERS

A 30-220

SECTION LIFTER—Curved, Narrow, in Wood Handle. The blade is made of nickel silver and is mounted in a polished ebony handle. Width of blade, 10 mm. Total length, 140 mm..... .65



A 30-220

A 30-230

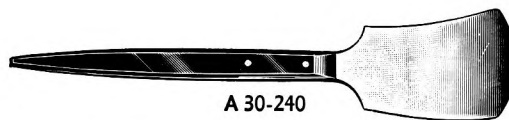
SECTION LIFTER—Curved, Medium Width, in Wood Handle. Similar to No. A 30-220, but with blade 20 mm. wide. Total length, 145 mm... .70



A 30-230

A 30-240

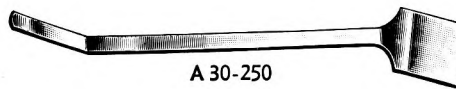
SECTION LIFTER—Curved, Wide, in Wood Handle. The same as No. A 30-220, but with blade 30 mm. wide. Total length, 150 mm..... .80



A 30-240

A 30-250

SECTION LIFTER—Nickel Plated Brass. Made entirely of metal with flat handle and flat blade 18 mm. wide. Total length, 100 mm..... .35



A 30-250

A 30-260

SECTION LIFTER—All Metal, Double End. The blades are of nickel silver and in two widths, 11 and 22 mm. Total length, 200 mm..... .90



A 30-260

A 30-270

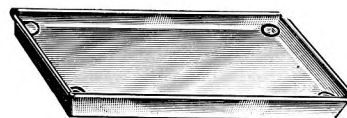
DISSECTING TENACULUM—All Steel. With handle serrated and nickel plated. The shank and hook are polished steel. Length, 160 mm. Each 1.00



A 30-270

A 30-280

DISSECTING TRAY—Sheet Tin. With a metal loop fastened in each of the 4 corners. Dimensions, 11 x 9 x 1½ inches.50



A 30-280

MICRO SLIDES and COVER GLASSES

ALLIED
MICRO SLIDES
No. 1
22 x 40 - 1/2

*See
Pages
680
and
681*

ALLIED
Non Corrosive
Cover Glasses
No. 1
SQUARES
22 mm - 1/2

ALLIED
Non Corrosive
Cover Glasses
No. 2
Rectangular
22 x 40 - 1/2

CLINICAL and
DIAGNOSTIC APPARATUS



A 19-230
Blood Lancet



A 19-240
Blood Lancet
Automatic Improved



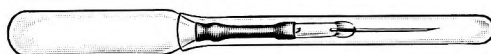
A 19-250
Blood Lancet
Deland



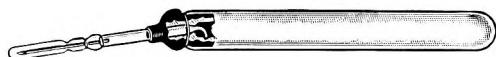
A 19-260
Blood Collecting Needle
Hagedorn



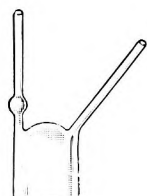
A 19-270
Blood Collecting Tube
Wright



A 19-280
Blood Collecting Tube
Keidel



A 19-290
Blood Collecting Tube
Venule



A 19-300

Blood Collecting
Tube—Noguchi
Vacuum

A 19-230

BLOOD LANCET—Automatic Spring Release. With lever release and adjustment to regulate depth of incision. Has flat sharpened point, blunt shield, and can be taken apart for cleaning or sterilizing. Chrome plated..... 1.50

A 19-240

BLOOD LANCET—Automatic Spring Release. Identical with No. A 19-230, but with pointed shield 1.50

A 19-250

BLOOD LANCET—Deland. The depth of incision can be regulated by adjusting the protecting sleeve. The blade is made of stainless steel, arrow shaped, with sharp cutting edges, can be taken apart for cleaning or sterilizing..... 1.85

A 19-260

BLOOD COLLECTING NEEDLE—Hagedorn. A straight Hagedorn needle, 3 inches long and used by many as a blood lancet..... .15

A 19-270

BLOOD COLLECTING TUBE—Wright. Of soft glass, with finished top edge for rubber tubing and carefully drawn point. Length 6 inches.. .10
Per dozen 1.00

A 19-280

BLOOD COLLECTING TUBE—Keidel. Consisting of evacuated ampoule, rubber washer and tubing, needle and test tube cover..... .20
Per dozen 2.00

A 19-290

BLOOD COLLECTING TUBE—Venule. For taking specimens of blood for Wasserman and Kahn tests. Consists of a regular venule valve and fitting inserted into an evacuated flint glass, round bottom tube. It can easily be resealed for transporting the blood sample. Vial can be emptied by simply removing rubber stopper.
Each25
Per dozen 2.50

A 19-300

BLOOD COLLECTING TUBE—Vacuum, Noguchi. Consisting of a flat bottom flask, 20 ml. capacity with 2 small bore tubulatures. Designed for the collection of serum for immunological test or for field collection of samples for cultivation, but not intended for taking blood for Wasserman test 1.00

PYREX BRAND CULTURE DISHES

A 29-400

100 x 10 mm.
100 x 15 mm.
100 x 20 mm.



All Sizes—Per Pair..... .38

HEMACYTOMETERS

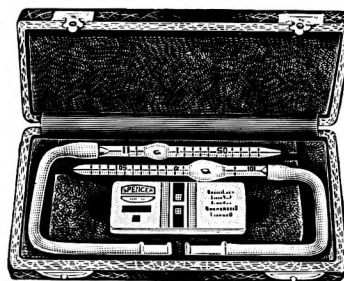
SPENCER BRIGHT-LINE
DOUBLE NEUBAUER RULING

A 19-310

HEMACYTOMETER — Spencer Bright Line. Instead of grey lines on a glaring light background, it provides a soft grey background with bright lines. This is due to the lines being ruled in a metal surface which is fused into the usual glass surface. There is a slight concavity on the lower side of the chamber, directly under the rulings. This eliminates the possibility of scratches appearing on the under surface of the chamber, directly under the rulings and impairing efficiency of the operation. Complete with double Neubauer counting chamber, 2 cover glasses, Thoma diluting pipettes for both red and white corpuscles, in leatherette case..... 13.00

A 19-320

HEMACYTOMETER—Spencer Bright Line. Identical with No. A 19-310 but with counting chamber, cover glasses and pipettes with Bureau of Standards certification..... 19.00



A 19-310 Standard
A 19-320 Certified
Spencer—Double

LEVY

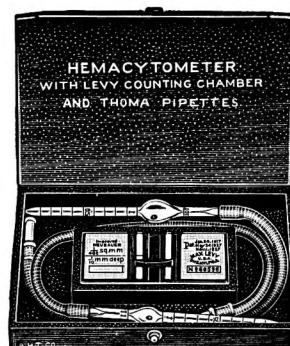
SINGLE NEUBAUER RULING

A 19-330

HEMACYTOMETER — With Levy Counting Chamber, Improved Single Neubauer Ruling, Student Model. In a sturdy case, with wooden frame covered with dark red imitation leather. Of convenient size for carrying in the pocket or for insertion in the carrying case of the microscopes mostly used. Complete with counting chamber of one piece construction, with improved Neubauer single ruling, 2 cover glasses, and 2 diluting pipettes, 1 for red and 1 for white corpuscles; in leatherette case..... 9.00

A 19-340

HEMACYTOMETER — With Levy Counting Chamber, Single Neubauer Ruling, Certified. Identical with No. A 19-330, but with counting chamber, cover glasses and pipettes certified by U. S. Bureau of Standards. Complete in leatherette case..... 14.00



A 19-330 Student Model
A 19-340 Certified
Levy—Single

LEVY

DOUBLE NEUBAUER RULING

A 19-350

HEMACYTOMETER — With Levy Counting Chamber, Double Neubauer Ruling, Student Model. Otherwise identical with No. A 19-330. Complete in leatherette case..... 11.00

A 19-360

HEMACYTOMETER — With Levy Counting Chamber, Improved Double Neubauer Ruling, Certified. Identical with No. A 19-350, but with counting chamber, cover glasses and pipettes certified by U. S. Bureau of Standards. Complete in leatherette case..... 17.00

LEVY-HAUSSER

DOUBLE NEUBAUER RULING

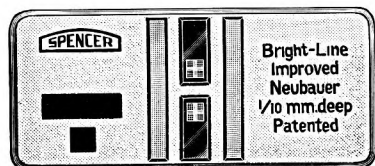
A 19-370

HEMACYTOMETER—With Levy-Hausser Counting Chamber, with Double Neubauer Ruling. Otherwise identical with No. A 19-330. Complete in leatherette case. Each..... 15.00

A 19-380

HEMACYTOMETER—With Levy-Hausser Counting Chamber, With Double Neubauer Ruling, Certified. Identical with No. A 19-370, but with counting chamber, cover glasses and pipettes certified by U. S. Bureau of Standards. Complete in leatherette case..... 21.00

COUNTING CHAMBERS



A 19-510

A 19-520

SPENCER BRIGHT LINE
DOUBLE NEUBAUER RULING

A 19-510

HEMACYTOMETER COUNTING CHAMBER—
Double Improved Neubauer Ruling, Spencer Bright Line. Of 1 piece construction. This is identical with that supplied in No. A 19-310. Counting chamber only with 2 cover glasses but without case. 9.00

A 19-520

HEMACYTOMETER COUNTING CHAMBER—
Double Improved Neubauer Ruling, Spencer Bright Line, Certified. Identical with No. A 19-510 but counting chamber and cover glasses certified by U. S. Bureau of Standards. This is the same as supplied with No. A 19-320. Counting chamber only with 2 cover glasses, but without case. . 12.00

LEVY

SINGLE NEUBAUER RULING

A 19-530

HEMACYTOMETER COUNTING CHAMBER—
Levy, Single Improved Neubauer Ruling. The same as supplied with Nos. A 19-330, A 19-390, and A 19-450. Counting chamber only with 2 octagonal cover glasses, but without case. 6.00

A 19-540

HEMACYTOMETER COUNTING CHAMBER—
Levy, Improved Single Neubauer Ruling, Certified. Identical with No. A 19-530, but with counting chamber and cover glasses certified by U. S. Bureau of Standards. The same as supplied with Nos. A 19-340, A 19-400, and A 19-460. Counting chamber only with 2 octagonal cover glasses, but without case. 8.00

LEVY

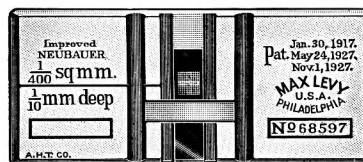
DOUBLE NEUBAUER RULING

A 19-550

HEMACYTOMETER COUNTING CHAMBER—
Levy, Improved Double Neubauer Ruling. The same as supplied with Nos. A 19-350, A 19-410, and A 19-470. Counting chamber only with 2 octagonal cover glasses, but without case. . . . 8.00

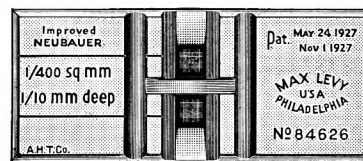
A 19-560

HEMACYTOMETER COUNTING CHAMBER—
Levy, Improved Double Neubauer Ruling, Certified. Identical with No. A 19-550, but with counting chamber and cover glasses certified by U. S. Bureau of Standards. The same as supplied with Nos. A 19-360, A 19-420, and A 19-480. Counting chamber only with 2 octagonal cover glasses, without case. 11.00



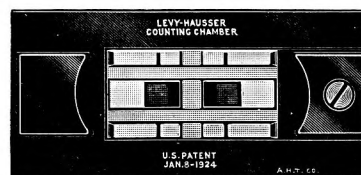
A 19-530

A 19-540



A 19-550

A 19-560



A 19-570

A 19-580

LEVY-HAUSSER

DOUBLE NEUBAUER RULING

A 19-570

HEMACYTOMETER COUNTING CHAMBER—
Levy-Hausser, Improved Double Neubauer Ruling. Of one piece construction with bakelite holder, pair of cover glass clips and 2 octagonal cover glasses, without case. The same as supplied with Nos. A 19-370, A 19-430, and A 19-490. . . 12.00

A 19-580

HEMACYTOMETER COUNTING CHAMBER—
Levy-Hausser, Improved Double Ruling, Certified. Identical with No. A 19-570, but counting chamber and cover glasses certified by U. S. Bureau of Standards, without case. The same as supplied with Nos. A 19-380, A 19-440, and A 19-500. 15.00

FUCHS-ROSENTHAL

WITH TWO RULINGS

A 19-590

HEMACYTOMETER COUNTING CHAMBER—
Fuchs-Rosenthal, Two Rulings. For counting cells in cerebro-spinal fluid etc. It has a cell depth of 0.2 mm. with ruling consisting of sixteen 1 mm. squares each subdivided into 16 smaller squares; with two cover glasses, without case. 8.00

A 19-600

HEMACYTOMETER COUNTING CHAMBER—
Fuchs-Rosenthal, Two Rulings, Certified. Identical with No. A 19-590 but counting chamber and cover glasses certified by U. S. Bureau of Standards. Without case. 11.00

A 19-650

HEMACYTOMETER COUNTING CHAMBER—Levy, of Green Glass. With improved Neubauer double ruling, 2 cover glasses, without case. 8.00

A 19-660

HEMACYTOMETER COUNTING CHAMBER—Certified, Levy, of Green Glass. Identical with No. A 19-650, but with counting chamber and cover glasses certified by U. S. Bureau of Standards, without case..... 11.00

A 19-670

HEMACYTOMETER COUNTING CHAMBER—Fuchs-Rosenthal, Two Rulings, Green Glass. Cell depth 0.2 mm., with 2 cover glasses, without case. Each 8.00

A 19-680

HEMACYTOMETER COUNTING CHAMBER—Certified, Fuchs-Rosenthal, Two Rulings, Green Glass. Identical with No. A 19-670, but with counting chamber and cover glasses certified by U. S. Bureau of Standards, without case.... 11.00

A 19-690

HEMACYTOMETER COUNTING CHAMBER—Quadruple Chamber, Green Glass. With 2 improved Neubauer rulings and 2 Fuchs-Rosenthal rulings, cell depth 0.1 mm. For making duplicates of both red and white cell counts, for checking purposes. With 2 cover glasses 25 x 28 mm., without case..... 10.00

A 19-700

HEMACYTOMETER COUNTING CHAMBER—Certified, Quadruple Ruling, Green Glass. Identical with No. A 19-690, but with counting chamber and cover glasses certified by U. S. Bureau of Standards. Without case..... 14.00

A 19-710

HEMACYTOMETER COUNTING CHAMBER—Levy-Hausser, Green Glass. Consists of ruled glass slide of green glass with improved Neubauer double ruling, in bakelite holder; with pair of cover glass clips and 2 cover glasses. Without case..... 12.00

A 19-720

HEMACYTOMETER COUNTING CHAMBER—Certified, Levy-Hausser, Green Glass. Identical with No. A 19-710, but with counting chamber and cover glasses certified by U. S. Bureau of Standards, without case..... 15.00

A 19-730

COVER GLASS CLIPS—Of Nickel Silver. For holding cover glass in position on bakelite holder of Levy-Hausser Counting Chamber. Per Pair .50

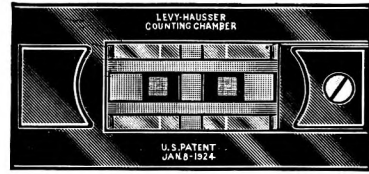
HEMACYTOMETER COVER GLASSES

A 19-740

HEMACYTOMETER COVER GLASS—Rectangular, Size 20 x 21 mm. With optically plane surfaces, thickness between 0.4 to 0.6 mm. For use with single ruled counting chambers..... .50

A 19-750

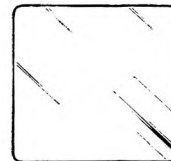
HEMACYTOMETER COVER GLASS—Rectangular, Size 20 x 21 mm., Certified. Identical with No. A 19-740, but engraved with official certification mark by U. S. Bureau of Standards..... .75



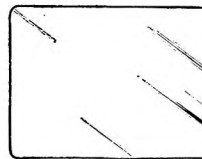
A 19-710
Green Glass



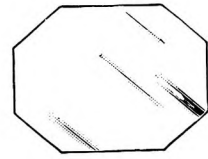
A 19-730
Cover Glass Clips



A 19-740



A 19-760



A 19-780

A 19-760

HEMACYTOMETER COVER GLASS—Rectangular, Size 20 x 26 mm. With optically plane surfaces, thickness between 0.4 and 0.6 mm. For use with double ruled counting chambers..... .50

A 19-770

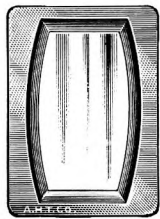
HEMACYTOMETER COVER GLASS—Rectangular, Size 20 x 26 mm., Certified. Identical with No. A 19-760, but engraved with official certification mark of U. S. Bureau of Standards..... .75

A 19-780

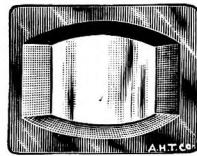
HEMACYTOMETER COVER GLASS—Octagonal, Size 20 x 26 mm. With optically plane surfaces, thickness between 0.4 mm. and 0.6 mm. For use with single or double counting chambers..... .50

A 19-790

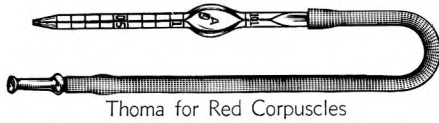
HEMACYTOMETER COVER GLASS—Octagonal, Size 20 x 26 mm., Certified. Identical with No. A 19-780 but engraved with official certification mark of U. S. Bureau of Standards..... .75



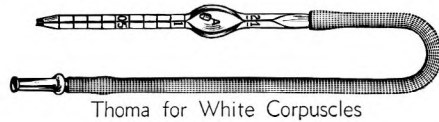
A 19-800
20 x 29 mm.



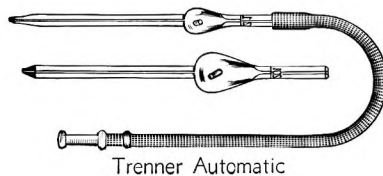
A 19-820
20 x 26 mm.



Thoma for Red Corpuscles



Thoma for White Corpuscles



Trenner Automatic

HAUSSER REINFORCED COVER GLASSES

A 19-800

HEMACYTOMETER COVER GLASS—Haussier, Reinforced, Precision, Size 20 x 29 mm. With transparent area 14 x 20 mm., thickness 0.4 mm. For use in blood counting with chambers, with ordinary cell depth of 0.1 mm. 2.00

A 19-810

HEMACYTOMETER COVER GLASS—Haussier Reinforced Precision, Certified. Identical with No. A 19-800, but engraved with official certification mark of U. S. Bureau of Standards. 2.25

A 19-820

HEMACYTOMETER COVER GLASS—Haussier Reinforced Precision, Size 20 x 26 mm. With transparent area 12 x 12 mm., thickness of 0.18 mm. For use with 1.9 mm. oil immersion objectives other than those of Zeiss, in connection with Petroff-Hausser Bacteria Counter No. A 19-620. 2.00

A 19-830

HEMACYTOMETER COVER GLASS—Haussier Reinforced Precision, Certified. Identical with No. A 19-820, but engraved with official certification mark of U. S. Bureau of Standards. 2.25

REINFORCED COVER GLASS
FOR ZEISS
OIL IMMERSION OBJECTIVES

A 19-840

HEMACYTOMETER COVER GLASS—Haussier Reinforced Precision, Size 20 x 25 mm. With transparent area 12 x 14 mm., thickness 0.18 mm. For use with Zeiss oil immersion objectives in connection with Petroff-Hausser Bacteria Counter, No. A 19-620. 2.00

BLOOD DILUTING PIPETTES

| | |
|----------------------------|----------|
| <i>Thoma Red</i> | A 19-850 |
| <i>Thoma White</i> | A 19-870 |
| <i>Rieder White</i> | A 19-890 |
| <i>Trenner Red</i> | A 19-900 |
| <i>Trenner White</i> | A 19-920 |

THOMA FOR RED CORPUSCLES

A 19-850

HEMACYTOMETER DILUTING PIPETTE—Thoma, Exax Blue Line, For Red Corpuscles. Diluting 1 to 100 and 1 to 200. With 10 inches rubber tubing and mouthpiece. (Kimble #36500) Each..... 1.00

A 19-860

HEMACYTOMETER DILUTING PIPETTE—Thoma, Exax Blue Line. Certified. Identical with No. A 19-850, but engraved with official certification mark of U. S. Bureau of Standards. (Kimble #36503) 2.00

THOMA FOR WHITE CORPUSCLES

A 19-870

HEMACYTOMETER DILUTING PIPETTE—Thoma, Exax Blue Line. For White Corpuscles. Diluting 1 to 10 and 1 to 20 with 10 inches rubber tubing glass mouthpiece. (Kimble #36505). 1.00

A 19-880

HEMACYTOMETER DILUTING PIPETTE—Thoma, Exax Blue Line. Certified. Identical with No. A 19-870, but engraved with official certification mark of U. S. Bureau of Standards. (Kimble #36508) 2.00

RIEDER FOR WHITE CORPUSCLES

A 19-890

HEMACYTOMETER DILUTING PIPETTE—Rieder, White. Dilution ratio 1 to 20 for white corpuscles, with 10 inches rubber tubing and mouthpiece. 1.30

TRENNER FOR RED CORPUSCLES

A 19-900

HEMACYTOMETER DILUTING PIPETTE—Trenner, Red. With automatic capillary volume adjustment. The pipette is made by fusing to a separately made bulb, a piece of straight capillary tubing, the upper end of which terminates abruptly in a ground and polished surface at right angles to the longitudinal axis. The capillary volume of this piece of tubing is adjusted to exactly 1/200th of the content of the bulb. This dispenses with the necessity for any engraving on the capillary tube since in use it is filled completely, and there is need for only one graduation, that is on the upper capillary, by which the dilution and total content of the pipette is controlled. Dilution ratio 1 to 200 for red corpuscles. Complete with 10 inches rubber tubing and mouthpiece. 2.00

A 19-910

HEMACYTOMETER DILUTING PIPETTE—Trenner, Certified, For Red Corpuscles. Identical with No. A 19-900, but engraved with official certification mark of U. S. Bureau of Standards. Each 3.40

TRENNER FOR WHITE CORPUSCLES

A 19-920

HEMACYTOMETER DILUTING PIPETTE—
Trenner, White. Similar to No. A 19-900, but ad-
justed for a dilution ratio of 1 to 20 for white
corpuscles. Complete with 10 inches rubber tub-
ing and mouthpiece..... 2.00

A 19-930

HEMACYTOMETER DILUTING PIPETTE—
Trenner, White, Certified. Identical with No.
A 19-920, but engraved with official certification
mark of U. S. Bureau of Standards. Complete
with 10 inches rubber tubing and mouthpiece.
Each..... 3.40

PIPETTE ACCESSORIES

A 19-940

CLOSURE—For Hemacytometer Pipettes. This
is made of hard rubber and is used for sealing
pipette by constricting the rubber tubing. It can
also be used for shaking the pipette by hand. .25

A 19-950

MOUTHPIECE—For use with diluting pipettes.
Each..... .10

A 19-960

RUBBER TUBING—For use with diluting pi-
pettes; 3 mm. bore, 1 to 1½ mm. wall.
Per foot..... .10

E B E R B A C H

BLOOD PIPETTE SHAKING MACHINE

A 19-970

SHAKER—Pipette, Eberbach, Holds 6 Pipettes.
Pipette holder removable. May be held on shaker
at any angle in the horizontal plane. 3½ inch
rocker arm. 1 inch arc stroke. Speed 0-400 oscil-
lations per minute. Variable resistance motor
110 volts A.C. or D.C. Mechanism completely en-
closed with off-on switch and rheostat conven-
iently located. Wrinkle aluminum finish of fine
quality. All heavy close fitting bearings of cast
iron, ball bearing for crank bearing. General
purpose shaking for small flasks and test tubes
can be done by removing pipette holder and
using vertical steel shaft on the rocker arm.
Various clamps can be fastened to rod to hold
flasks, test tubes, or small bottles. Approximate
weight, 24 pounds. Shaker complete with pipette
holder, ½-inch x 5 inch rod for general purpose
shaking. For 110 volts A.C. or D.C. Each.. 60.00

A 19-980

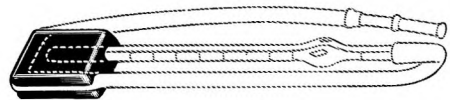
RESISTANCE, Only—For use with No. A 19-970
when operated from 220 volt A.C. or D.C. circuit.
Each..... 6.00

A 19-990

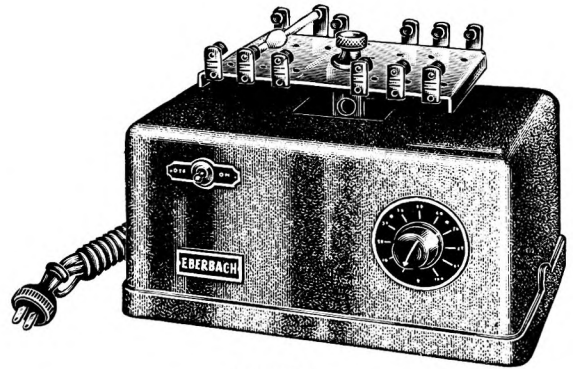
RUBBER BELT, Only—For replacement in No.
A 19-970 shaker..... .50

A 20-000

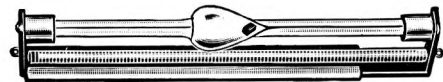
PIPETTE HOLDER—As supplied with No.
A 19-970. A good general purpose pipette holder
for the laboratory. Sits flat on the table or may
be used for carrying clean and filled pipettes.
Consists of 6 holders on an aluminum plate. 13.50



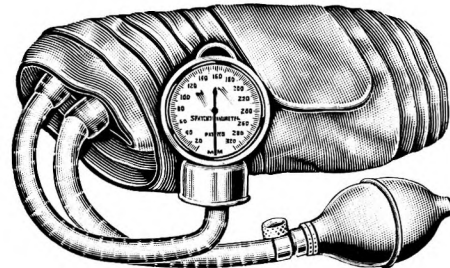
A 19-940



A 19-970



A 20-010
Pipette Holder



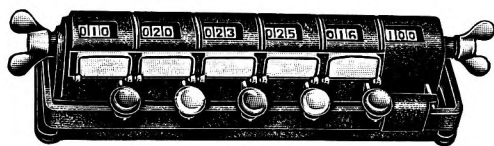
A 20-020
Sphygmomanometer

A 20-010

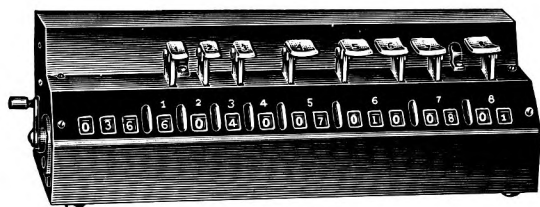
PIPETTE HOLDER—Nickel plated, with spring
closure. Suitable for use with pipettes from 100
mm. to 140 mm. in length. For safely and con-
veniently carrying filled pipettes from ward to
laboratory. 2 small screws are provided, by
means of which the holder can be attached to the
bottom of a wooden tray or carrier..... 1.75

A 20-020

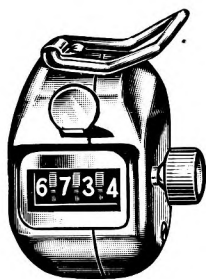
SPHYGMOMANOMETER—Aneroid, Tycos. A
portable instrument with dial reading to 300 mm.
Manometer is finished in black with chromium
trim, silver dial and unbreakable crystal. It is
self-verifying and guaranteed for 10 years. Com-
plete with inflating bulb, air control valve, arm
band and rubber tubing in black leather carrying
case..... 25.00



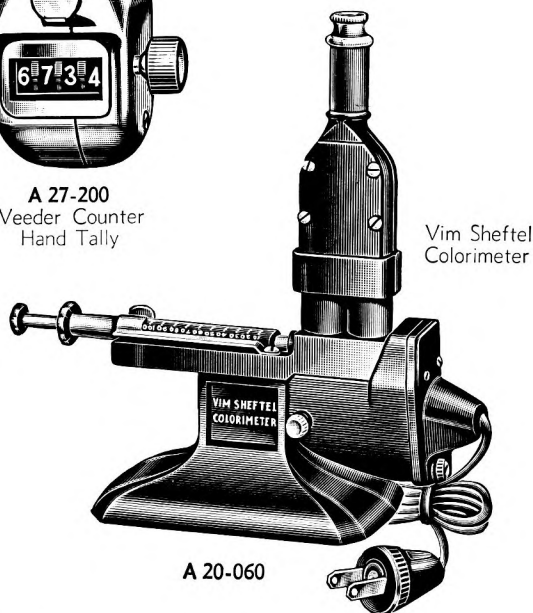
A 20-030
Lab-Count Denominator



A 20-050
Blood Cell Calculator—8 Key



A 27-200
Veeder Counter
Hand Tally



Vim Sheftel
Colorimeter

A 20-060

A 20-030

COUNTING APPARATUS—Lab-Count Denominator. Designed to eliminate the tedious procedure of obtaining the accurate count of each classification by making it a mechanical operation. It does away with the necessity of figuring the percentages of each type of blood cell. A key representing each type of blood cell operates a counting unit. Each time a key is pressed one count is recorded in the counting unit controlled by that key. When a total of 100 counts have been recorded the machine automatically locks, and the percentage of each of the several types of blood cells counted is plainly visible in the window of each counting unit. Machines contain two resets. One on the left resets the tabulating units, the one on the right resets the totalizer

lock unit. Closer percentages than a total of 100 can easily be made after the first 100 counts by resetting the totalizer lock unit to zero and proceed with the sound count of 100. Since a total of 200 counts have been made the percentages are obtained by dividing the total of counts in each window of the tabulating units by two. Red and white corpuscle counts may be made by clamping down the totalizer operating bar. The totalizer mechanism is then out of operation. Any two or more keys of the machine may be used for this work. Small model containing five tabulating units and a totalizer unit. Three wheels per unit. 23.00

A 20-040

DITTO—But with 8 tabulating units and a totalizer unit. 3 wheels per unit. 33.50

A 20-050

BLOOD CELL CALCULATOR—Marbel, 8 Key. Specially designed for blood counting and other similar computations. Consists of a series of cyclometers, gears and counters mounted on shafts with 1 set back for all, and a cumulative adding apparatus that is unique in its kind with a signaling bell for each hundred. For ordinary counts of leucocytes, erythrocytes, or platelets, one key is used for each square of counting chamber and the sum of all squares of counting chamber and the sum of all squares is then to be found under aperture marked total. On completion of count all figures in the apertures are brought to zero by resetting handle on the left side. 60.00

A 27-200

VEEDER COUNTER —Hand Tally. For use in counting bacteria colonies, blood corpuscles, platelets, etc. Designed to fit comfortably in either right or left hand. Tallies up to 10,000 and can be reset to zero by turning small knob on the side. 5.00

MICRO CLINICAL COLORIMETER

A 20-060

COLORIMETER—Vim-Sheftel. A micro-colorimeter in which plungers are stationary and the depth of the unknown controlled by means of a 1 ml. syringe. Ideal for determination of blood sugar, urea, nitrogen, nonprotein-nitrogen, and the phenolsulfonphthalein renal function test. Tests may be run rapidly at the bedside or in the office with a minimum of sample. Lenses and prism are of highest optical quality. Complete as described with built-in colorimeter lamp, book of directions and conversion tables, but without hemoglobin standard or blue glass filter. ... 35.00

A 20-070

COLORIMETER—Vim-Sheftel. Identical with Vim-Sheftel Colorimeter, No. A 20-060 but with mirror and without built-in lamp. 28.50

A 20-080

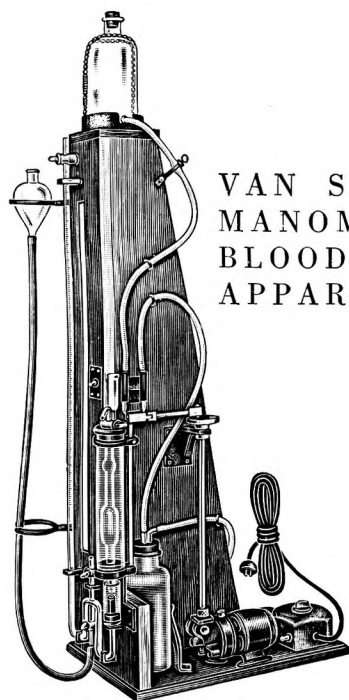
HEMOGLOBIN STANDARD—Vim-Sheftel, Van Slyke. For Nos. A 20-060 and A 20-070. 3.50

A 20-090

HEMOGLOBIN BLUE FILTER—Vim-Sheftel. For Nos. A 20-060 and A 20-070. 1.75

A 20-100

YELLOW FILTER, Only—For use with Nos. A 20-060 and A 20-070 in the determination of blood sugar.75



A 22-370

VAN SLYKE MANOMETRIC BLOOD GAS APPARATUS

A 22-370

BLOOD GAS APPARATUS—Manometric, Van Slyke. Designed for the determination of gases in blood and other solutions by vacuum extraction and manometric measurement. See: "Quantitative Clinical Chemistry," Vol. 2, 1932, Peters and Van Slyke.

The Phipps and Bird apparatus has been improved so as to offer the features desired by those who use such equipment. It retains the original features of the older models which met with favorable comment.

The extraction chamber has a volume of 50 ml., with graduations at $\frac{1}{2}$ ml., 2 ml., and at 50 ml. At the top is a sample cup graduated to 6 ml. and communicating with the extraction chamber through a stopcock.

The extraction chamber is mounted in a cage, directly driven by a universal motor of the highest grade. The upper and lower positions of the leveling bulb are adjustable to suit the user. Complete, glare free illumination of the manometer is provided.

The manometer and extraction chamber are certified for accuracy. The Van Slyke specifications are rigidly adhered to.

The wash bottle is mounted with special care and cannot be tipped over, and the glass tips of the suction and distilled water lines are held in convenient receptacles. The support is of selected oak, assembled in a workmanlike manner, and finished with durable clear lacquer. The panel which carries the manometer is removable from the support so that it can be used as a protection to the manometer for shipment.

In addition to these more or less standard features a tachometer is provided on the drive motor which indicates the shaking rate, an exclusive feature on the apparatus. The tachometer instrument is especially designed for direct use on the motor shaft at high speed. The tachometer is of the magnetic type, individually calibrated for accuracy. The motor shaft itself carries the magnet so that the motor bearings become the tachometer magnet bearings.

Furnished complete on stand with extraction chamber of highest accuracy enclosed in a water jacket; a thermometer; a manometer; leveling bulb, 250 ml.; adjustable leveling bulb support; direct motor drive with worm-drive reducer; aspirator and waste bottles. Illumination is furnished by fluorescent lamp. For 110 volts A.C. or D.C. Complete as described..... 135.00
Oscillation counter, extra..... 15.00

A 22-380

EXTRACTION CHAMBER, Only—Of No. A 22-370. A combined extraction chamber and gas measuring pipette. It is suitable for micro or macro determinations. The cup at the top is graduated up to 6 ml. in $\frac{1}{2}$ ml. subdivisions. Capacity, 50 ml. with graduations at $\frac{1}{2}$ ml., 2 ml. and 50 ml. (Kimble #46510)..... 15.00

A 22-385

DITTO—With certificate giving actual capacity at calibration marks. (Kimble #46512).... 18.00

A 22-390

WATER JACKET, Only—For use with No. A 22-380 extraction chamber..... 1.00

A 22-400

MANOMETER, Only—Of No. A 22-370 with 3 stopcocks. (Kimble #46515)..... 16.00

A 22-410

THERMOMETER, Only—As supplied with No. A 22-370. Range $+10^{\circ}$ to $+40^{\circ}$ C. in 1° divisions. 2.00

A 22-420

PIPETTE—Without Stopcock, Exax. Accurately calibrated, and delivers between 2 graduations with the lower one high enough for easy reading when the pipette is inserted in the cup of the reaction pipette. Capacity, 0.2 ml. (Kimble #37046) 1.00

A 22-430

PIPETTE—With Stopcock, F Exax. Similar to No. A 22-420, but provided with F stopcock No. 1 to control delivery. (Kimble #37046)

| Capacity, ml. | 1 | 2 | 3 |
|--------------------|------|------|------|
| Each | 2.50 | 2.50 | 2.50 |

A 22-440

PIPETTE—Hempel. Employed for storing gas or liquid samples prior to analysis in the Van Slyke manometric gas apparatus; and for introducing the gas sample into the extraction chamber. Capacity of each bulb, 50 ml. Pyrex glass. 8.50

A 22-450

MICRO BURETTE—Van Slyke-Hiller. For delivery of small quantities of reagents into the extraction chamber of a Van Slyke manometric blood gas apparatus, particularly in the determination of hemoglobin by the carbon monoxide capacity method. It has a delivery tip below the stopcock with reduced beveled end and a funnel top to facilitate filling. Capacity, 2 ml. graduated in 0.01 ml. divisions..... 5.00

A 22-460

CARBON DIOXIDE APPARATUS—Alveolar Fredericia. For the determination of carbon dioxide in alveolar air in the diagnosis of acidosis of the blood..... 11.00