

STEWART

WIND INSTRUMENTS



M. C. STEWART

ARLINGTON, MASS.

Observation of wind direction and velocity.

15-
52530



The wind is the most important and most variable factor affecting the weather and our daily lives.

Accurate knowledge of wind movement is often desirable and frequently essential in many fields — on land, at sea, or in the air.

Many people who have long been interested in winds, and the direction and speed of the wind have wished for some means of gratifying their natural curiosity concerning this subject.

The high cost of wind instruments has generally prevented their extensive use, but this obstacle has now been removed by the development of reliable, low cost instruments of standard design and rugged construction.

Stewart wind instruments are specially designed to meet the need for low priced instruments of reasonable accuracy, and hundreds are now in use by the U. S. Forest Service, National Park Service, Bureau of Entomology and Plant Quarantine, U. S. Engineers, and the Canadian Meteorological Service, as well as many private agencies and individuals in all parts of the world.

The use of these instruments will prove fascinating and instructive, and their nominal cost places them within the reach of every one.



The electric Wind Vane is equipped with electrical contacts for connection by cable to 8 separate lights arranged on a dial indicator. Each of the lights corresponds to one of eight points of the compass so as to furnish accurate, dependable, remote indication of wind direction, day or night.

One of the lights is lighted at all times, and when the vane is halfway between two points of the compass two lights are lighted so that 16 point indication is obtained. A low voltage electric circuit is used so that the current consumption is very small. Two or three dials can be connected to the same instrument giving simultaneous indication in different places if desired.

The Anemometer is made for connection to a low voltage electric circuit operating a flash or buzzer indicator. The instrument is the 1/60th mile type, and closes the circuit a number of times per minute which is equal to the speed of the wind in miles per hour. A table of corrections is furnished so that wind velocities can be measured within an accuracy of 1 mile per hour.

Any convenient source of current can be used, such as dry batteries, storage battery, or a bell ringing transformer furnishing 6 to 8 volts, and elaborate wiring is not required.



The use of Stewart electric wind instruments now makes it practical to secure reliable, continuous indication of wind direction or velocity at nominal cost — anywhere — anytime.

Why not get going with the wind?



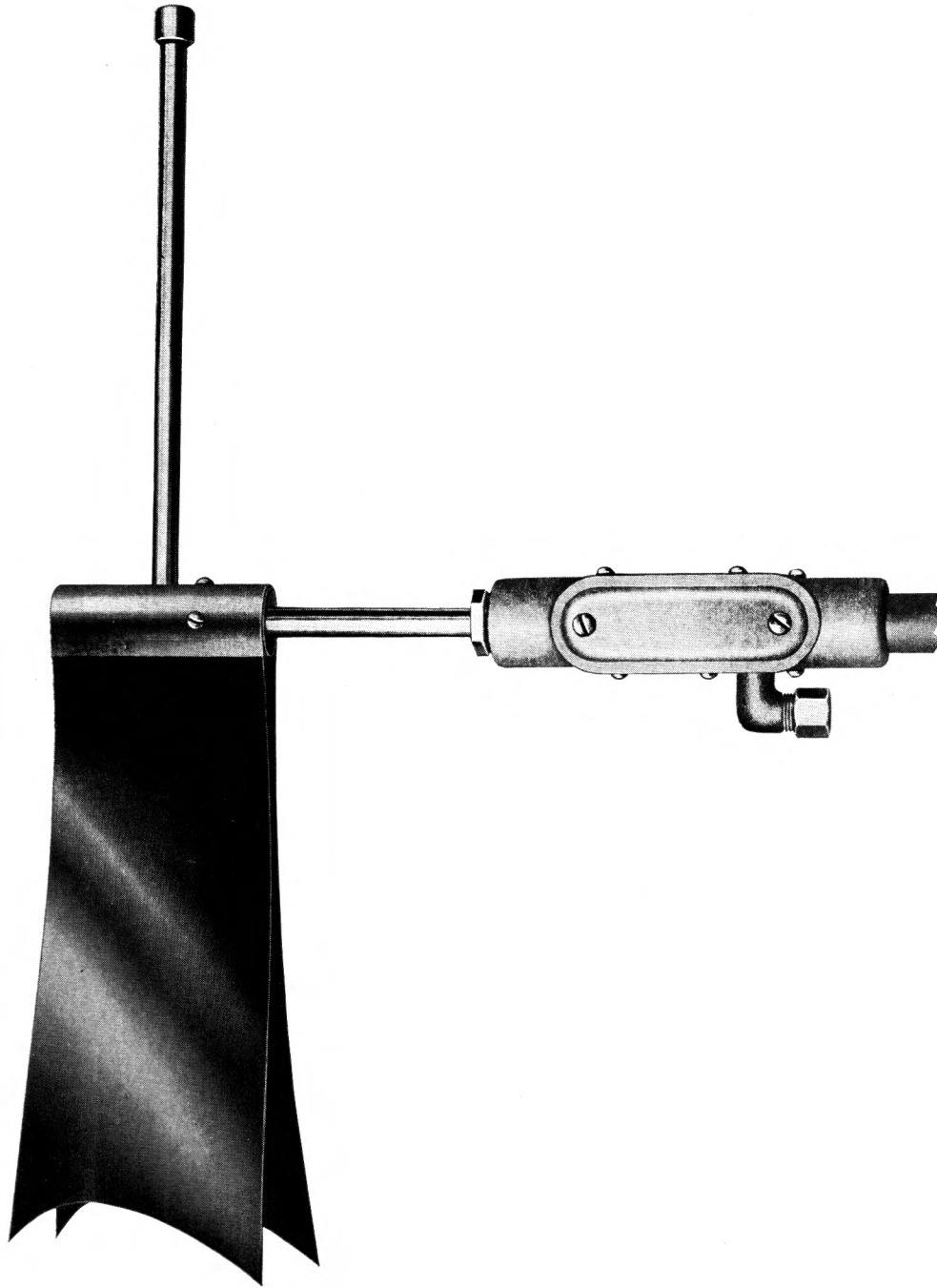
M. C. STEWART

Manufacturer ❖ 432 Massachusetts Ave. ❖ Arlington, Mass.

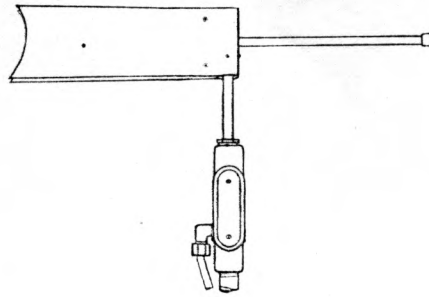
ELECTRICAL DEVICES ❖ WEATHERVANES
METEOROLOGICAL INSTRUMENTS

M. C. STEWART

ARLINGTON, MASS.



Electric
WIND VANE



Electric

WIND VANE

General Specifications

1. All brass, streamlined vane; permanently balanced.
2. Spread tail of vane insures suppressed oscillation, and accurate pointing in light wind.
3. Corrosion-resistant cast steel spindle box, cadmium coated, electro-galvanized, with aluminum lacquer finish.
4. Base of spindle box is threaded with standard $\frac{1}{2}$ " pipe thread, permitting easy installation by means of ordinary pipe, and pipe fittings.
5. Stainless steel spindle.
6. Self-lubricating, oilless, sleeve bearings. Instrument will operate indefinitely without oil. Spindle rides on bronze ball thrust bearings.
7. Only 3 moving parts. All internal mechanism and binding posts for connecting wires fully enclosed and protected from the weather, yet readily accessible for cleaning and adjustment.
8. Self-adjusting, frictionless, rolling ball contact brush with positive contact pressure. Eight-contact commutator, and individual binding posts for connecting wires.
9. Brass elbow and compression nut fitting to hold cable. Made for use with standard lead covered telephone cable.
10. Repairs and repair parts obtainable at reasonable cost.

Electric WIND VANE

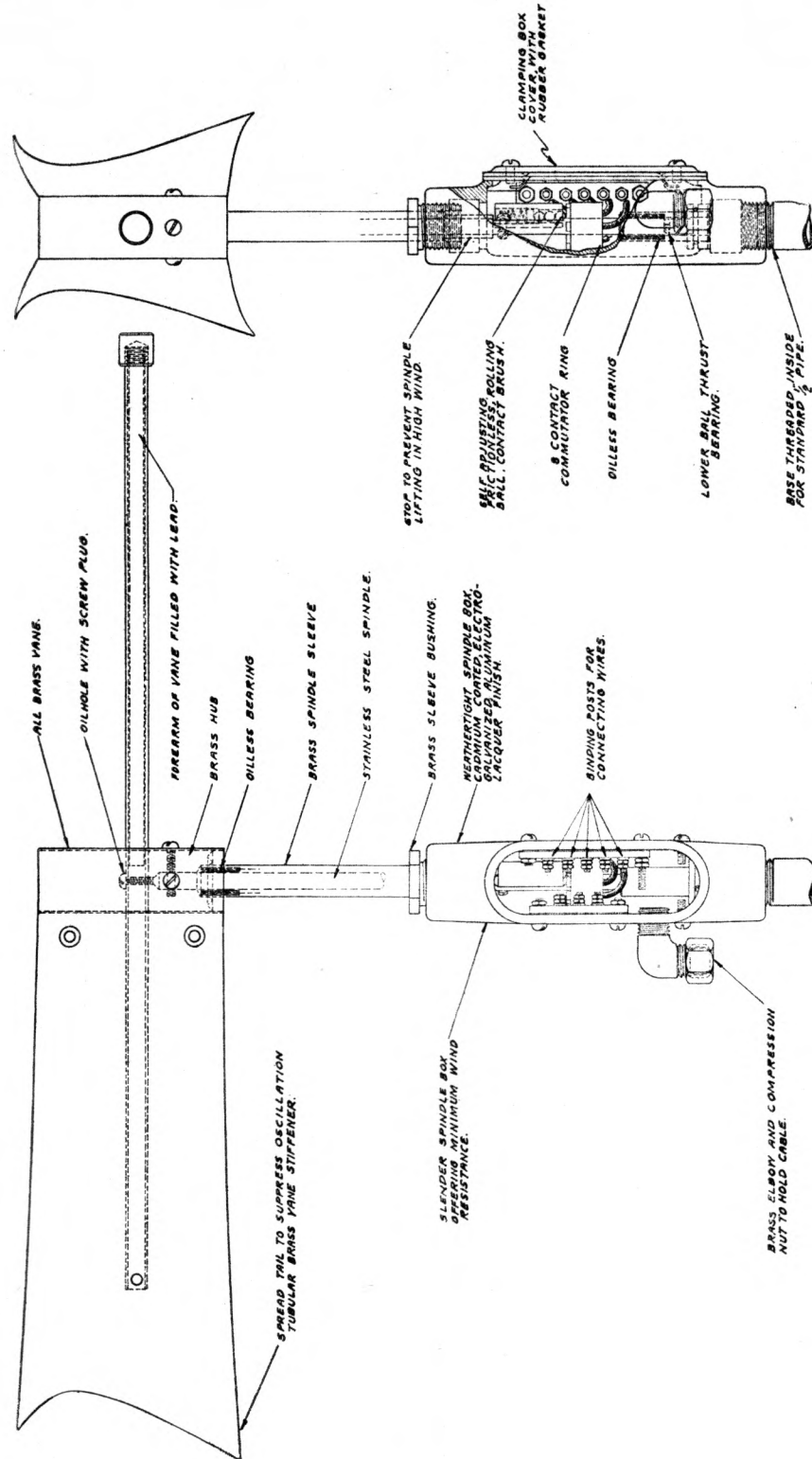


Illustration one third actual size.

Height overall 12 inches.

WIND VANE

Instructions

Installation

Instrument is shipped from factory completely assembled ready for installation. Unpack carefully taking special precaution against bending or damaging the spread tail of the vane. Examine instrument and make sure it has suffered no injury in transportation.

Wind instruments should be exposed where a free movement of the wind occurs, obstructed as little as possible by nearby structures or objects. This is attained by elevating the instrument as much as possible by means of vertical pipe supports or towers. At the same time the instrument must be accessible for cleaning and occasional adjustment.

Base of the spindle box is threaded to receive a standard $\frac{1}{2}$ " (American Thread) pipe fitting to hold instrument in place. Any standard $\frac{1}{2}$ " pipe fitting such as a flange plate, nipple, elbow or length of pipe can be used according to the circumstances. Instrument should be screwed on securely. For best results the spindle should be absolutely vertical, although satisfactory results will be obtained at moderate inclinations of the spindle due to the permanent balance of the vane.

Do not attach the cable until instrument is firmly installed, except in cases where it is possible to coil the free end of cable and rotate same in unison with the cable fitting on the instrument box while this is being screwed on its pipe support. Or, if instrument is to be put up in a location not conveniently accessible, use a standard pipe union in the supporting pipe; screw instrument on top section firmly, attach and connect cable, and install by joining the two sections of the pipe union.

Electrical Connections

This instrument is designed for connection to a low voltage electric circuit operating 6-8 volt pilot lamps arranged on a dial. Western Electric #126 - 12 wire lead covered cable is recommended for use with this instrument, or any satisfactory equivalent. This cable is approximately $\frac{3}{8}$ " diameter and contains 12 #22 double cotton covered wires. Nine wires are required for this wind vane, three being left as spares or for connections to an anemometer when used in conjunction with it.

Cable should be run in a neat, secure manner from location of the instrument to the location of the dial indicator. Allow 6 or 8 inches extra at both ends for making connections. Be sure that cable is supported at frequent intervals its entire length by straps, staples or by running through pipe or conduit. If the current supply is not near the indicator, the most practicable method is to run the cable from the instrument to a battery or transformer box, and then from the battery box to the dial indicator. Both the instrument support and exterior portion of cable should be effectively grounded in some way to reduce the hazard of lightning.

The left side of instrument box is equipped with a brass elbow and compression nut fitting to hold connecting cable. To attach cable to instrument make a circular cut around cable 8 inches from end and about half the thickness of lead sheath. Bend sharply at this point and lead sheath will break off clean and can be slipped off the end. Unscrew nut and ferrule from brass elbow on instrument box, and slip the nut and ferrule over end of cable. If cable is smaller than ferrule wrap friction tape around end of cable sheath so that ferrule fits snug. Bunch and twist slightly the 12 exposed wires putting a slight crook at outer end, then fish the 12 wires up through brass elbow into instrument box far enough to bring ferrule up into its seat and allow compression nut to be screwed on thereby holding cable firmly in place.

The dial indicator is provided with an extra socket in the center for connection to a 1/60 mile anemometer for indication of wind velocity. When an anemometer is used in conjunction with the electric wind vane, the extra wires in the wind vane cable can be used so that it is not necessary to run separate wires for the anemometer. The most practical method is to mount both instruments on the same pipe support by the use of a cross arm or tee three or four feet in length, attaching the instruments at either end with elbows. The connecting wires may be run through the bottom of the anemometer box, through the cross arm pipe, up through the bottom of the wind vane box, and there connected to the extra wires in the cable. Instructions for wiring through the bottom of the instrument boxes are furnished with the anemometer.

Inside instrument box there are 9 binding posts (8 insulated and 1 ground or common). Three are on left side of box and 6 are on right side. Attach one wire to each binding post. Begin at the bottom binding posts and work up. Measure and cut back each wire to a convenient length, skin off insulation about $\frac{3}{8}$ " at end, make a hook and slip hook around screw of binding post between the two small nuts, then tighten the outer nut. DO NOT run the outer nuts off the end of screw as they are difficult to replace. DO NOT loosen the inner nuts. DO NOT touch or disturb the commutator ring behind the binding posts. Make a record of the color code of each wire as it is connected. Wires are best attached and nuts tightened with small slim nose pliers or strong tweezers. Coil tightly the wires not used and stuff into space at bottom of box.

Orientation

The accurate adjustment of the vane requires a knowledge of the meridian of the place where installed, and as many buildings contain a great deal of iron, and as the support is itself generally of iron, a magnetic compass cannot usually be relied upon. A true north and south line can often be established by reference to a reliable map or chart of the locality or to adjacent landmarks. Wind vanes are customarily adjusted to true north and not to magnetic north.

Where a true north and south line cannot be established with certainty from other information, the following method may be employed: the wind vane support being adjusted as nearly as possible to a vertical position, the shadow cast by the support on a horizontal surface, at true solar noon, will be an exact north and south line. For this purpose the observer must ascertain the exact difference between the standard time in use at his station and the true local time. To this difference must then be added or subtracted, as the case may require, the so-called equation of time, which is the number of minutes before or after local noon at which the sun passes the meridian. This information can usually be obtained upon request to a local surveyor, civil engineer, or office of the Weather Bureau.

The initial orientation of the instrument box after it is screwed on to the pipe support is immaterial as any one of the eight binding posts may serve for north or south. After the cable has been attached to the instrument and run to the point where the dial is to be located hold or tie the vane in a true north direction.

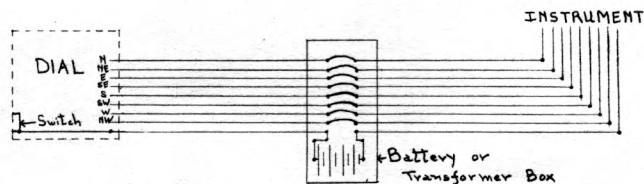
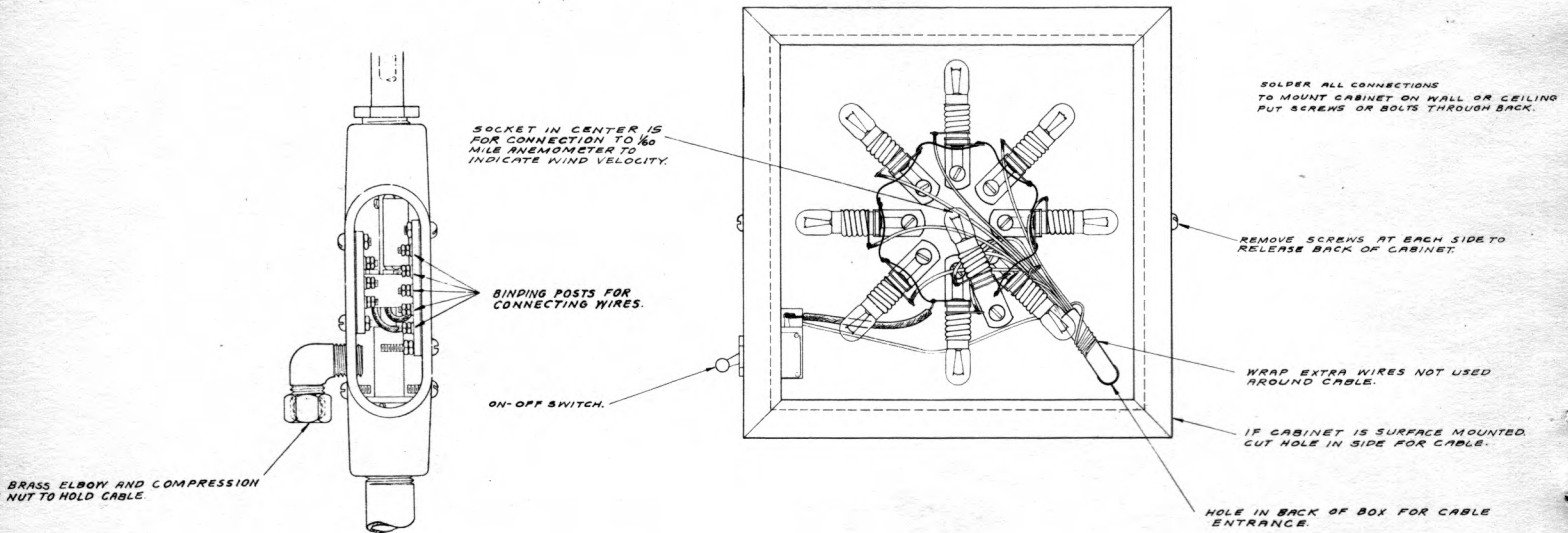
To connect the cable to the dial first determine which is the live contact (north) on the instrument by testing each of the eight wires in turn on one of the lights. Check the color code of this wire with the record made when making connections inside the instrument box, and the other 7 contacts will then follow in clock-wise rotation according to the scheme below, thus: 1 - 2 - 3 - 4 - 5 - 7 - 8 - 9.

	1	
Binding posts	9	2 Binding posts
Left side of	8	3 Right side of
instrument box	7	4 instrument box
	5	
	6	6-----Common or ground wire

Screw lamps into each of the sockets so that the filaments will be parallel to the glass dial. Connect the common wire to the switch on the dial indicator and the 8 other wires to their respective lights. Check all connections by having someone rotate the vane and observe the sequence of the lights on the dial. If any transposition of the wires has occurred it will be immediately apparent. All connections on the dial should then be soldered.

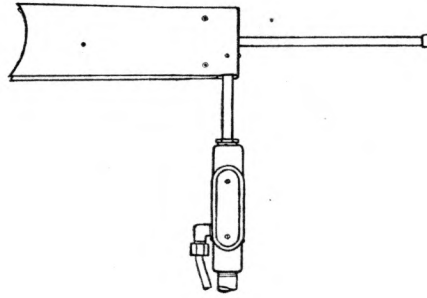
As a final adjustment the orientation of the instrument box should be re-checked so that when the vane is pointing exactly true north, the north contact will be equidistant from northeast and northwest contacts. A slight twist of the instrument box on the pipe support is all that is necessary to bring the northeast and northwest contacts into their proper relation with true north.

The diagrams below should be carefully studied before commencing installation of this instrument so that the design and construction may be fully understood.



M. C. STEWART

ARLINGTON, MASS.



Electric

WIND VANE

Instrument only, ready for installation, without dial or cable, packed in individual carton with instructions:

Price each

\$15.00

F. O. B. Arlington, Mass., U.S.A.

Shipping weight 6 lbs.

Western Electric No. 162 Lead Covered Cable is recommended for use with this instrument. This can be obtained from the Graybar Electric Co. or can be furnished by us. Price per ft: \$.20



DIAL INDICATOR

FOR ELECTRIC WIND VANE

White opal glass dial, black compass silhouette, in wood cabinet, 7 x 7 x 2", 8 miniature screw base sockets, ON-OFF toggle switch, ready for cable connections.

Suitable for shelf, wall, or ceiling mounting.

Extra socket in center of dial for wind velocity indicator.

Box of 10 6-8 volt pilot lamps furnished.

PRICE \$ 7.50

Western Electric No. 162 Lead Covered Cable is recommended for use with this instrument. This can be obtained from the Graybar Electric Co. or can be furnished by us. Price per ft: \$.20

Comparative Chart of Wind Velocities

DESCRIPTION	Velocity (Miles per hour)	CHARACTERISTICS
Calm	Less than 1	Smoke rises vertically.
Light	1 to 3 4 to 7	Direction of wind shown by smoke drift, but not by wind vanes. Wind felt on face; leaves rustle; ordinary vane moved by wind.
Gentle	8 to 12	Leaves and small twigs in constant motion; wind extends light flag.
Moderate	13 to 18	Raises dust and loose paper; small branches are moved.
Fresh	19 to 24	Small trees in leaf begin to sway; crested wavelets form on inland waters.
Strong	25 to 31 32 to 38	Large branches in motion; whistling heard in telegraph wires; umbrellas used with difficulty. Whole trees in motion; inconvenience felt in walking against the wind.
Gale	39 to 46 47 to 54	Breaks twigs off trees; generally impedes progress. Slight structural damage occurs (chimney pots and shingles removed).
Whole gale	55 to 63 64 to 75	Trees uprooted; considerable structural damage occurs. Rarely experienced except in coastal regions or high altitudes; accompanied by wide-spread damage.
Hurricane	Above 75	(The highest natural wind velocity ever officially recorded occurred at the summit of Mt. Washington, N. H., April 12, 1934. Maximum: 231 m.p.h.; total 24 hour wind movement: 3,095 miles; average: 129 m.p.h.)

Extra copies of this chart gladly furnished on request.

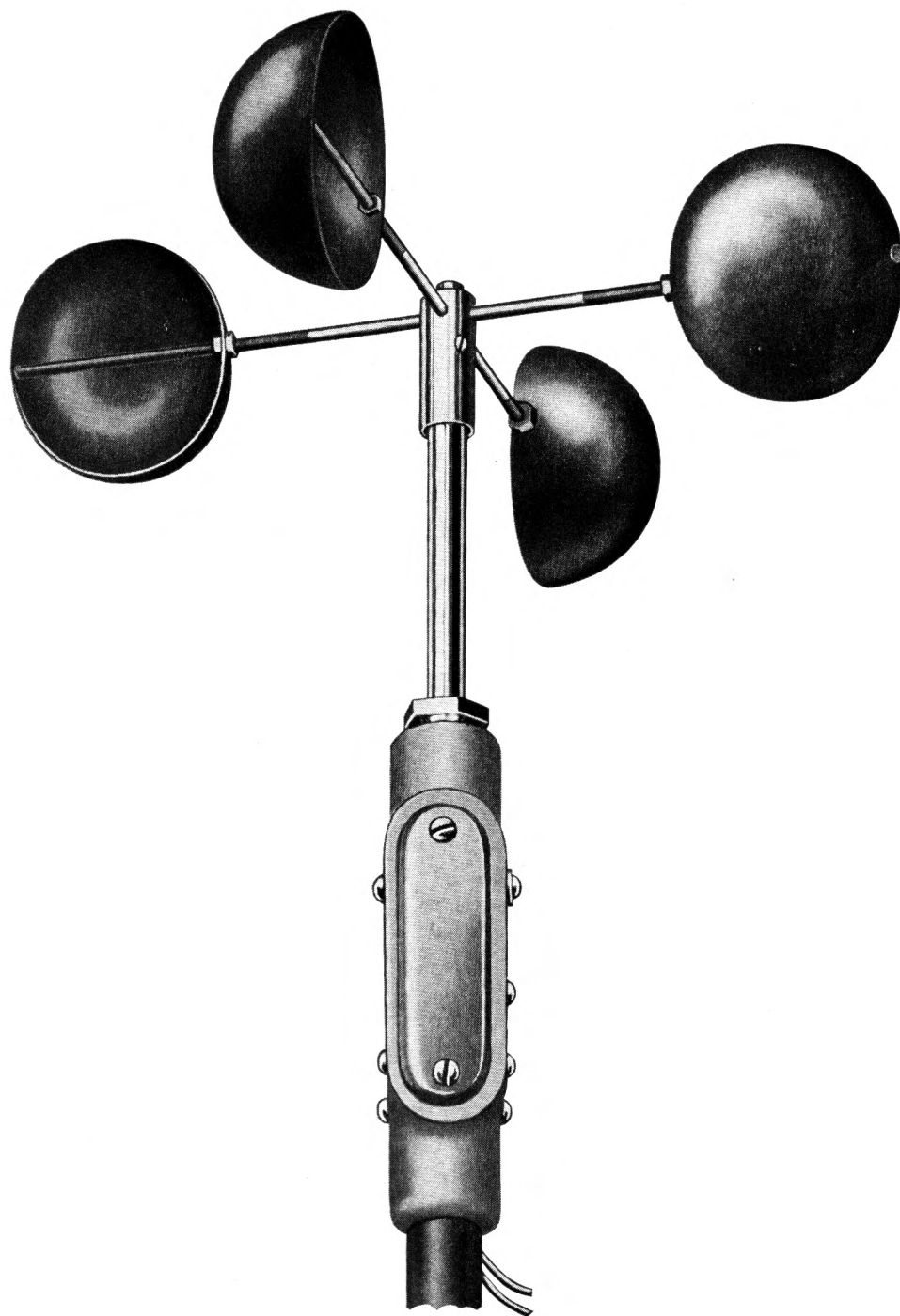
M. C. STEWART

Manufacturer ♦ 432 Massachusetts Ave. ♦ Arlington, Mass.

ELECTRICAL DEVICES ♦ WEATHERVANES
METEOROLOGICAL INSTRUMENTS

M. C. STEWART

ARLINGTON, MASS.



ANEMOMETER

TYPE B

ANEMOMETER

General Specifications

1. Four-cup wheel of standard design. Cup wheel replaceable without taking instrument apart.
2. Solid copper cups, riveted and lock-nutted on solid brass arms. Brass hub, and brass spindle sleeve.
3. Corrosion-resistant cast steel spindle box, cadmium coated, electro-galvanized, with aluminum lacquer finish.
4. Base of spindle box is threaded with standard $\frac{1}{2}$ " pipe thread, permitting easy installation by means of ordinary pipe, and pipe fittings.
5. Stainless steel spindle, with integral cut worm.
6. Self-lubricating, oilless, sleeve bearings. Instrument will operate indefinitely without oil. Spindle rides on bronze ball thrust bearings.
7. Only 3 moving parts. All internal mechanism and binding posts for connecting wires fully enclosed and protected from the weather, yet readily accessible for cleaning and adjustment.
8. Electrical contacts replaceable and adjustable without taking instrument apart. Lower contact is of heavy solid silver, to resist arcing, pitting, or corrosion.
9. Sensitive to wind of 3 m.p.h. and guaranteed to withstand a wind of 75 m.p.h.
10. Repairs and repair parts obtainable at reasonable cost.

TYPE B

ANEMOMETER

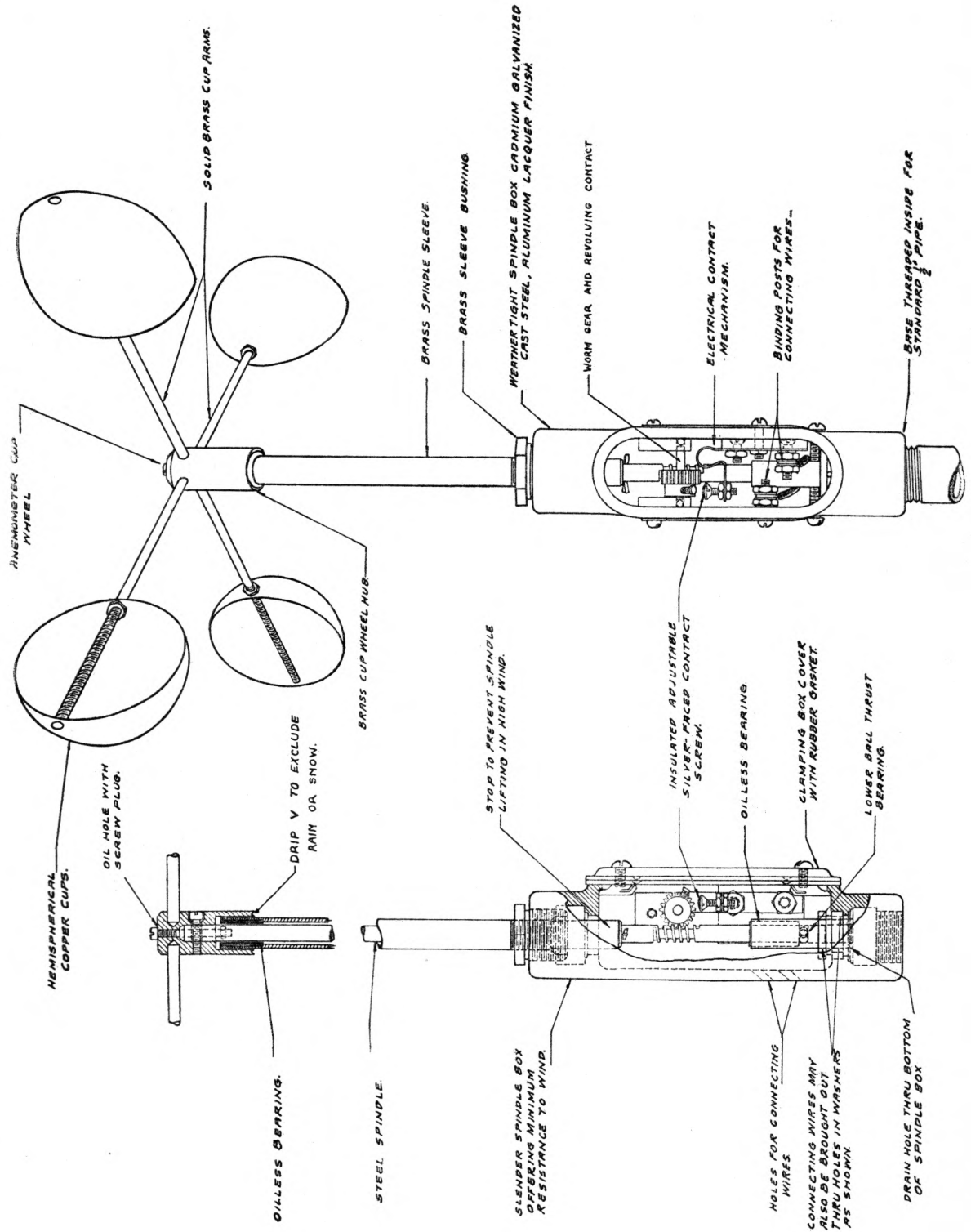


Illustration approximately half actual size.

Height overall 11 inches.

ANEMOMETER

Instructions

Installation

Instrument is shipped from factory completely assembled ready for installation. Unpack carefully taking special precaution against bending or damaging the cups or cup arms. Examine instrument and make sure it has suffered no injury in transportation.

Wind instruments should be exposed where a free movement of the wind occurs, obstructed as little as possible by nearby structures or objects. This is attained by elevating the instrument as much as possible by means of vertical pipe supports or by towers. At the same time the instrument must be accessible for cleaning, oiling, and occasional adjustment.

Base of the spindle box is threaded to receive a standard $\frac{1}{2}$ " pipe fitting to hold instrument in place. Any standard $\frac{1}{2}$ " pipe or fitting such as a flange plate, nipple, elbow, or length of pipe can be used according to the circumstances. Instrument should be screwed on securely making sure that spindle is absolutely vertical.

Electrical Connections

This instrument is designed for connection to a low voltage electric circuit operating a flash or buzzer indicator, or electrical recorder. Instrument is wired at the factory with two short lengths of wire which protrude diagonally down through the back of the spindle box.

One of these wires is red and the other is black. One half of the electric circuit inside the box is grounded to the box casting and the black wire is connected to this grounded portion of the circuit. The red wire is connected to the insulated part of the circuit and mechanism inside the box. The necessary length of wire should be spliced on to these short lengths, and then run in a neat manner to the location of the indicator or recorder. The black or ground wire should also be connected to ground if practicable, as this reduces somewhat the hazard of lightning.

If it is desired to run the connecting wires directly into the box to avoid splicing on to the short lengths furnished this may be done, care being taken to attach the ends to the binding posts in the same manner as the short lengths of wire which are removed.

If it is desired to run the connecting wires through the bottom of the box and down through the supporting pipe this may be done. In this case the short lengths of wire should be removed and the diagonal holes in the back of the box should be plugged with paint, tar, chewing gum, etc. Two pieces of spaghetti (such as used for wiring radio sets) should then be slipped down through the two holes (one at either side) in the washers that support the lower bearing assembly. The connecting wires must then be skinned back about 3 inches and slipped up through these pieces of spaghetti and fastened to the binding posts. Enough twist should be given the two wires below the box to permit screwing the box on to its support.

The current supply can be obtained from any practical source such as dry batteries, wet batteries, storage battery, wind driven generator, or bell-ringing transformer. The voltage should be kept as low as possible not exceeding 8 volts in any case. Only sufficient voltage should be used to flash the lamp or operate the buzzer or recorder satisfactorily. Excessive current will cause arcing and undue wear of the contacts.

The lower or silver faced contact screw is adjustable and also replaceable if necessary. This contact should be adjusted so that the revolving contact on gear wheel wipes very gently across its face, the movement of the supporting spring being hardly perceptible. Avoid too much pressure or excessive wear will occur. Silver face of contact screw should be kept clean at all times.

Lubrication

This instrument is equipped with self-lubricating or oilless bearings at upper and lower end of spindle; and the entire spindle rides on 4 ball thrust bearings at the lower end. The top of the cup wheel hub is provided with an oil hole and a screw plug. When installing the instrument it should be carefully oiled.

Remove the screw at the top of the cup wheel hub and flush several drops of a good grade light body oil (such as sewing machine oil) down through the oil hole. Replace the screw plug. Remove the cover of the spindle box and using a small brush or the end of a match put several drops of oil on the spindle, below the worm at the top of the lower bearing. Allow the wheel to run for a short time and then wipe off any excess oil that runs down the outside of the spindle sleeve, the upper portion of box interior, or that collects on the worm and worm gear inside the box. Any excess oil that runs down the spindle below the worm should be allowed to remain as this will work into the lower bearings.

While the instrument will run indefinitely thereafter without oil its performance will be considerably improved and the life of the bearings greatly prolonged by occasional oiling.

The worm, the worm gear carrying the revolving contact, and the steel pinion on which the worm gear turns should be wiped clean, and a small amount of vaseline, petrolatum, or white petroleum jelly should be smeared on these parts to insure their proper operation. Allow the wheel to run a short time and then wipe off any excess lubricant that may collect on the upper or lower contact screws. This procedure should be repeated at occasional intervals.

At least once a year remove the cup wheel and clean the top of spindle sleeve and inside of wheel hub; also wipe accumulated dirt and dust off the cups and arms. Be careful not to wipe any dust or dirt into the top bearing. Replace cup wheel and re-oil the instrument to insure clean working bearings.

After cleaning, oiling, or adjusting instrument replace box cover carefully making sure that rubber gasket is in proper place. Clamps on box cover should be screwed up firmly. Rubber gasket may be shellacked if an airtight seal is desired.

If at anytime instrument is taken out of service and placed in storage it should be oiled and greased in accordance with the above directions shortly before it is taken down.

Calibration

Improved Type B

The calibration of this instrument is as follows:

Number of contacts per minute, plus or minus the following factors, equals true wind speed in miles per hour, to within an accuracy of 1 mile per hour.

to 8 ---- plus 1	1 to 9 - plus 1	to 35 ---minus 5
to 16 --- zero 0	10 to 39 - zero 0	to 38 ---minus 4
to 20 ---minus 1	40 to 49 - minus 1	to 41 ---minus 3
to 24 ---minus 2	50 to 59 - minus 2	to 44 ---minus 2
to 28 ---minus 3	60 to 69 - minus 3	to 47 ---minus 1
to 31 ---minus 4		to 50 ---minus 0

When the instrument is new and is first put in service it will probably not be sensitive to extremely light wind owing to stiffness of the bearings. After 2 or 3 weeks exposure to moderately fresh winds the bearings will become worn in and the instrument will respond to a wind of 3 miles an hour and even less.

Repairs

Repairs, repair parts, and additional copies of these instructions may be obtained on request to the manufacturer.

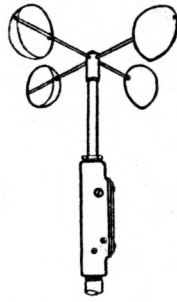
Made in U. S. A.

M. C. STEWART

ARLINGTON, MASS.

M. C. STEWART

ARLINGTON, MASS.



TYPE B

ANEMOMETER

Instrument complete, ready for installation, packed in individual carton with instructions:

Price each

\$15.00

F. O. B. Arlington, Mass.,

Shipping weight 5 lbs.

INDICATING LIGHT, for panel mounting, with miniature screw base socket, 6 volt lamp, and translucent plastic lens cap available in Red, Yellow, Green, Blue, or White. extra **\$.50**

Please specify color wanted.

PITRÉ & COMPAÑIA

ALMACEN NAVAL - ARTICULOS PARA YACHTS

PEDRO MENDOZA 2359



U. T. 21 BARRACAS 0605
COOP. TELEF. 51 BOCA

Buenos Aires. 2 de Novbre 1937

Señor. M.C. Stewart

Arlington 74, Mass

Muy señor nuestro.

MOTEURS MARINS "GRAY" · MOTEURS AMOVIBLES "EVINRUDE" & "ELTO" · MOTEURS "DIESEL"
EMBARCATIONS STANDARDISEES "MERMAID" ETC. · HELICES "FEDERAL-MOGUL" · SILENCIEUX "MAXIM"
PEINTURES MARINES "SMITH" · CENTRALES ELECTRIQUES · COMMANDES A DISTANCE "PNEUSELECTOR"
CONVERSIONS MARINES · REDUCTEURS & TRANSMISSIONS · GARCIEL NAUTIQUE
TOUTES LES FOURNITURES MARINES · CHAUSSEE DE MALINES 43 · ANVERS

Antwerp, the 21st october 1937.

DEPARTMENT OF TRANSPORT

ORIGINAL

OFFICE OF PURCHASING AGENT

Order No. **E-5428**
Req'n No. **E-116 M**
File No.

Messrs. M.C. STEWART,
Arlington, 74,
MASS.,
U.S.A.

M. C. Stewart, Esq., Ottawa, Ont., November 9th, 1937 193.....

432 A Massachusetts Avenue,
ARLINGTON, MASS., U.S.A.

Please furnish the undermentioned goods for the Department
the conditions below stated, on account of

Vote No. Service Stores

0-131
Aug. 1937

ORDER NO. **30.6**

MEET NO. **1**

U. S. DEPARTMENT OF THE INTERIOR

NATIONAL PARK SERVICE

Hawaii NATIONAL PARK

October 14, 1937 193

ORDER BLANK

M. C. Stewart
432A Massachusetts Ave.,
Arlington, Massachusetts

GENTLEMEN:

In accordance with your undated circular (U. S. Forest Service Contract) dated _____, please furnish this office with the following articles. All prices are to be f. o. b. Arlington, Mass. and ship via parcel post charges to be added to the invoice. Only first-class articles equal in every respect to those quoted upon will be accepted. Render certified bill in triplicate against National Park Service, and mail to Hawaii National Park, Hawaii, T. H. Mark all packages in shipment The Superintendent, Hawaii National Park, Hawaii via Hilo, T. H. Respectfully,
Edward G. Wingate
Edward G. Wingate Superintendent.

us,
accounts.
n:
,
E.

QUANTITY	DESCRIPTION
2 only	Stewart Type B Anemometers.

CERTIFIED T. D.
Wm. Cullow
For Comptroller of the Treasury
IMPORTANT: COPYING MUST BE
OTHERWISE

Furnish 2 copies
duly certified for
purposes.

McL:KB

Address, The Department of Transport, care of: **The Controller of Met**
315 Bloor Street
Toronto 5,

Wanted at once.

Prices of these goods are for delivery.

Receipts in duplicate direct to Consignee.

Order and requisition numbers to be put on each package shipped, and on each copy of invoice.

Freight and Express charges must be prepaid on all shipments unless otherwise instructed.

Reimbursement, amount should be entered on invoice and receipted bill attached.

Receipt of this order to be acknowledged, and prompt notification to be given of date of shipment.

All goods on this order are purchased subject to inspection.

A copy of Railway or Express Company's shipping bill must accompany each shipment.

An extra charge will be allowed for packing or cartage.

This order is to be returned promptly if it cannot be filled in accordance with the above.

This Department will not be responsible for goods delivered unless entered regularly through this Department.

W. C. Cullow

ITEM NO.	ARTICLES OR SERVICES	QUANTITY ORDERED
	Anemometer, Type B, complete	3

MARK ALL SHIPMENT

THE SUPERINTENDENT
HAWAII NATIONAL PARK
HAWAII, T. H.

All articles must be of good
production, and/or manufacture of
States, and certified invoice of
statement to that effect.

TELEPHONE
RIVERSIDE 2380.

LONDON CORINTHIAN SAILING CLUB,
LOWER MALL, HAMMERSMITH.

December 5th. 1937.

M.C. Stewart, Esq.

Dear Sir,
I thank you for your prompt attention, and the instrument arrived intact, and has been duly installed, working off a mains transformer to three points in the Club. The members are extremely pleased with it, and we compliment you on a beautifully made job.

Have pleasure in enclosing you draft. Will you let me have details of your other goods.

Thanking you,

Yours faithfully,
Raymond A. ...
Vice-Commodore

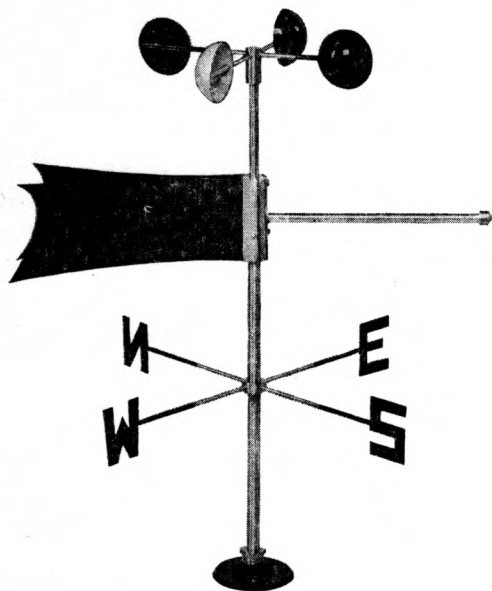
Enclosure.

Note.—Purchase orders will be prepared in quadruplicate. The original (WHITE) will go to vendor; numerically, the triplicate (YELLOW) to the stockkeeper without quantity stated; and the quadruplicate (GREEN) to the receiving office. The quadruplicate (GREEN) is received, when it will be withdrawn and attached to the duplicate copy of the voucher.

Just the thing for garage, garden, barn, tennis court, camp, or boat house!

FLYING ZEPHYR WEATHERVANE

This fascinating device shows visibly *both* direction and relative speed of the wind at all times. A source of unfailing interest to young and old, with many exclusive features not found in any other weathervane.



Varying rotation of the anemometer cup wheel shows changes in the velocity of the wind instantly. One cup is colored white and three black so that motion is easily observable. Cup wheel turns freely on stainless steel spindle, bronze ball-bearings; self-lubricating oilless sleeve bearing, inside weatherproof sleeve.

Distinctive arrow is unmistakably visible in any position. Spread tail insures accurate pointing in the lightest breeze.

Crossarms with directional letters lock in place by unique method without setscrews and cannot loosen.

Strongly made of brass and copper with 10 weatherproof ball-bearings.

Base is equipped with standard $\frac{1}{2}$ " threaded pipe fittings, permitting easy installation anywhere.

\$10.00

Height 20", crossarms 15", arrow 18",
cup wheel 9" diameter.

Attractive, modern, stream-lined design is patterned after standard instruments. Please note that this weathervane has no electrical mechanism, being made for visual observation only.

There is endless fascination in watching the graceful motion of this weathervane, through rain or shine, snow or sleet, as it goes merrily on its way.

Spirited as a lark, stout-hearted as an eagle, the "Flying Zephyr" shows you every variation in the direction or velocity of the wind. Built for long service and fully guaranteed. Enjoy it all the year round!

F. O. B. Arlington, Mass.

Shipping weight 6 lbs.