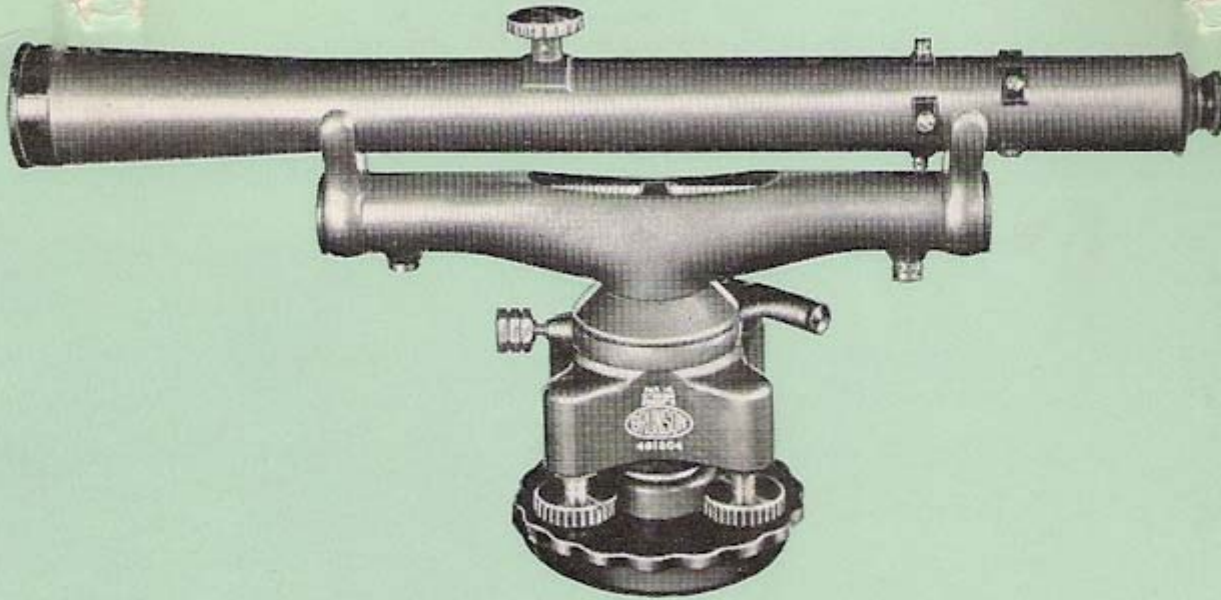


ADJUSTMENT AND CARE OF



Model 45

BRUNSON DUMPY LEVEL

INTRODUCTION

This booklet is compiled to aid in obtaining the best results in the use of the Brunson Dumpy Level, equipped with the Dust-proof Ball Bearing Spindle.

It contains instructions on set-up, adjustment, and care of this particular type instrument.

Proper use and care will aid you in retaining "LONGER-LASTING ACCURACY."

Serial No. _____ Use this number when writing.

BRUNSON INSTRUMENT COMPANY

USE OF LEVEL

Place carrying case on the ground or some firm support (never on the running board of a car) and remove level from case by grasping the telescope barrel with one hand. Steady the box with the other. Do not touch the level vial as the warmth of the hand may cause the liquid to expand, giving an error in reading. Screw the instrument to the tripod.

Set tripod securely in the ground, separating the legs for the desired height of the instrument. When convenient, it is best to get a good spread on the legs.

Loosen all three wing nuts on tripod bolts and retighten.

Make sure instrument is screwed on tripod securely. Center bubble by means of leveling screws. Do not put too much pressure on the leveling screws, but set them firmly. While it will not damage the spindle on a Brunson instrument, it may cause excessive wear on the leveling screws.

1

When it is necessary to set up on soft ground, be sure bubble is in the center when taking each reading. If this is done carefully, it is not necessary to "level up all around." By taking all shots with bubble in center, there is little chance for error.

Quite often when the instrument does not appear to be holding level, it is the tripod or the ground that is shifting. Avoid taking shots when other workers are moving near the tripod. Remove hands from both tripod and level when taking the final reading. If vibration should cause the level vial to get out of adjustment, it can easily be corrected as described in Art. I under "Adjustment of Level".

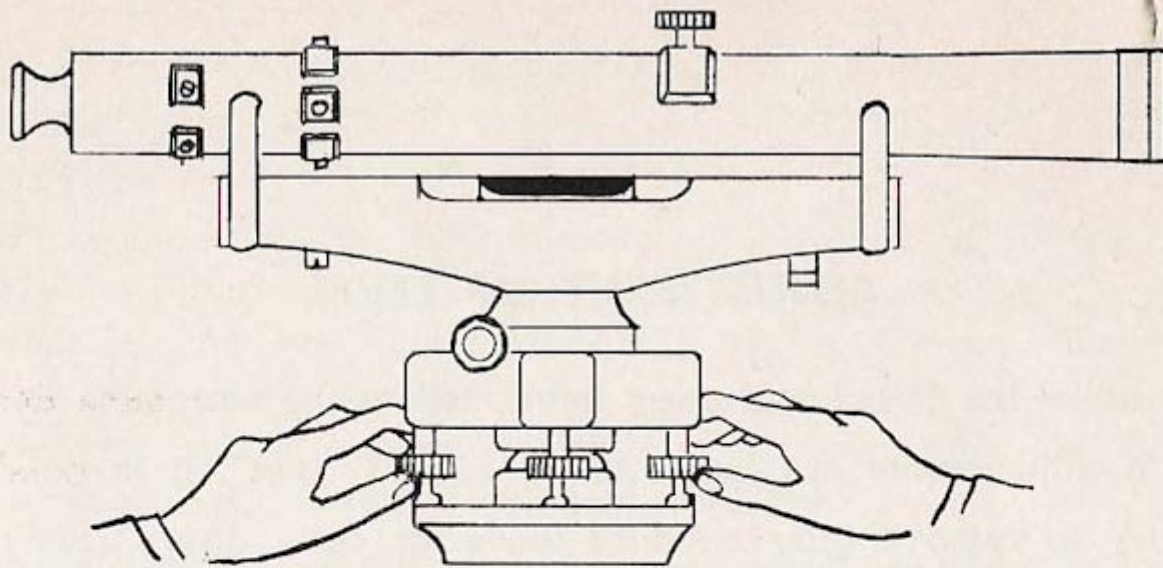
Very seldom the cross wires get out of adjustment. When once "set", and left alone, they will remain accurate for years.

2

ADJUSTMENT OF LEVEL

To adjust the Brunson Dumpy Level, follow the sequence described herein. If adjustments are found to be slightly "out", it is good practice to try to remove only one-half the error each day. This method of GRADUAL correction insures permanency of adjustments.

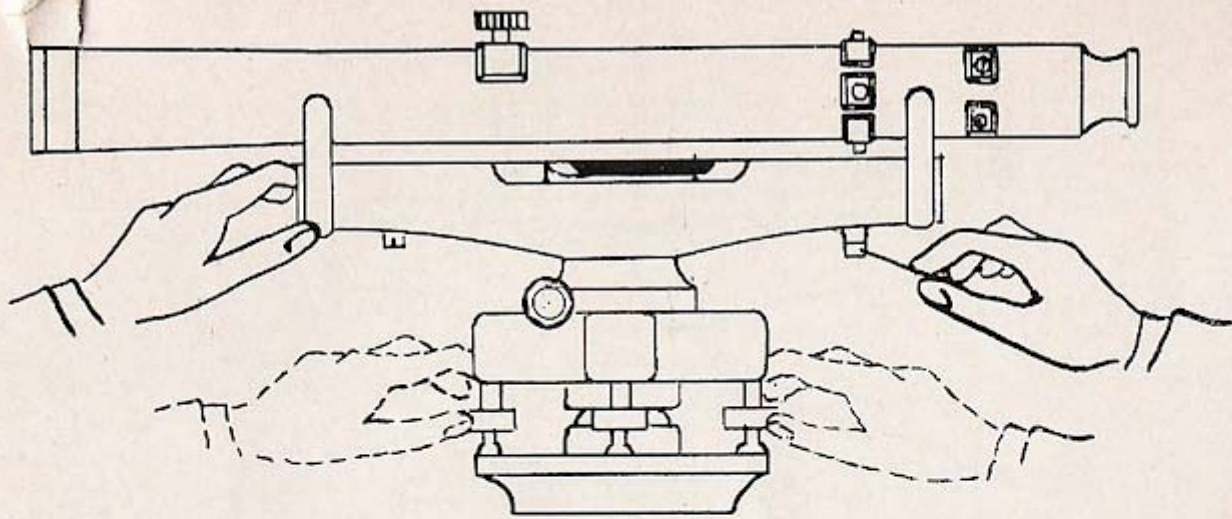
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Art I. Setting Bubble at Right Angles to Spindle

1. Set up instrument on tripod.
Place telescope directly over one pair of leveling screws.
Bring bubble to center by means of leveling screws.

4

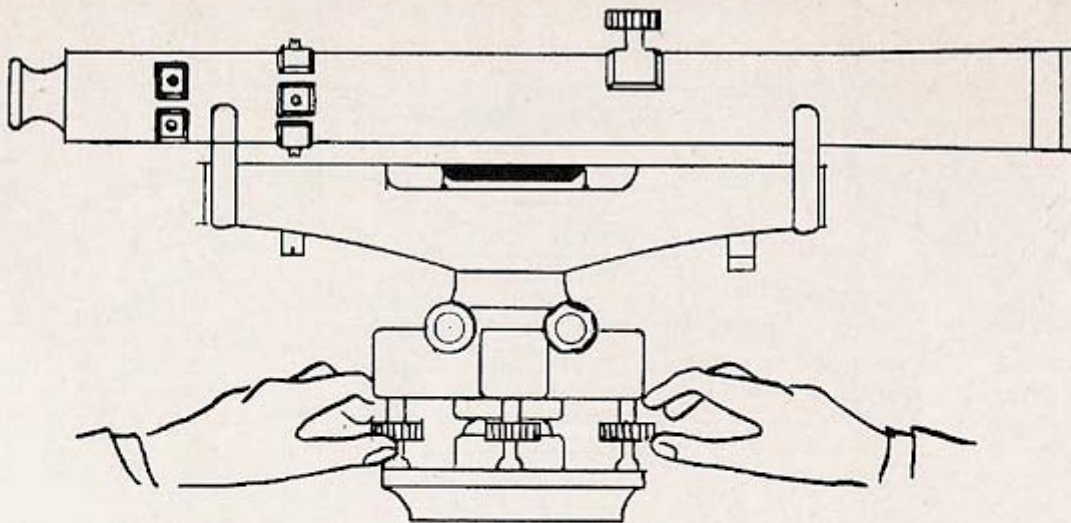


2. Reverse telescope by turning on spindle.

Take out half the bubble error with adjusting pin on bottom capstan screw.

Take out the remainder of error with leveling screws.

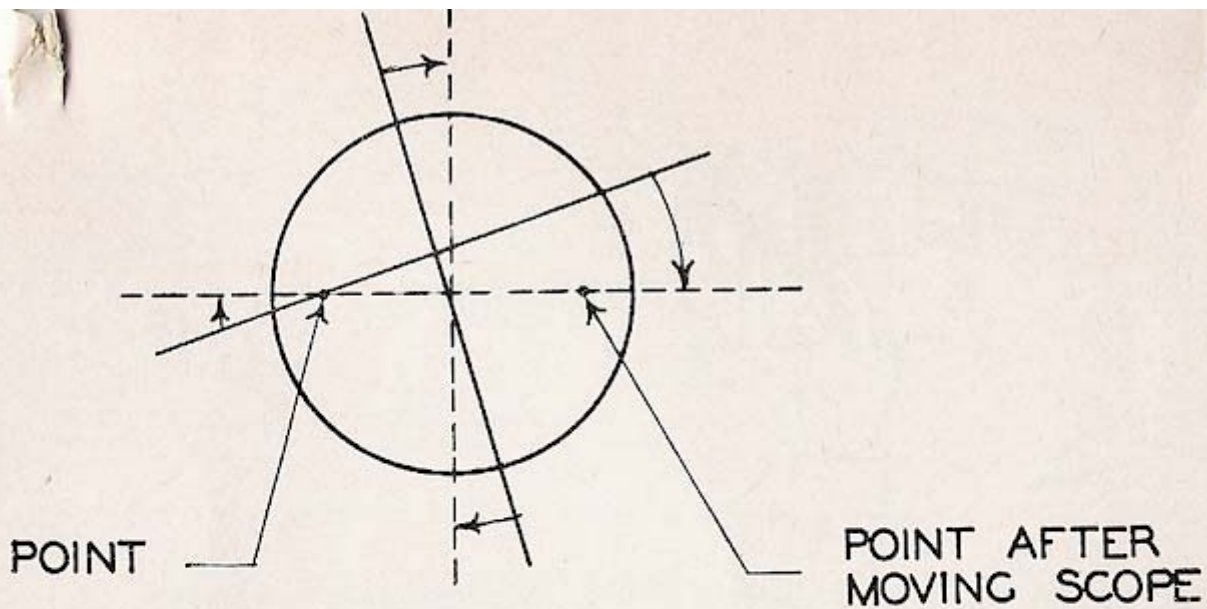
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3. Level over other pair of screws and repeat operations 1 and 2.

Alternate over both pairs of screws until bubble remains in center.

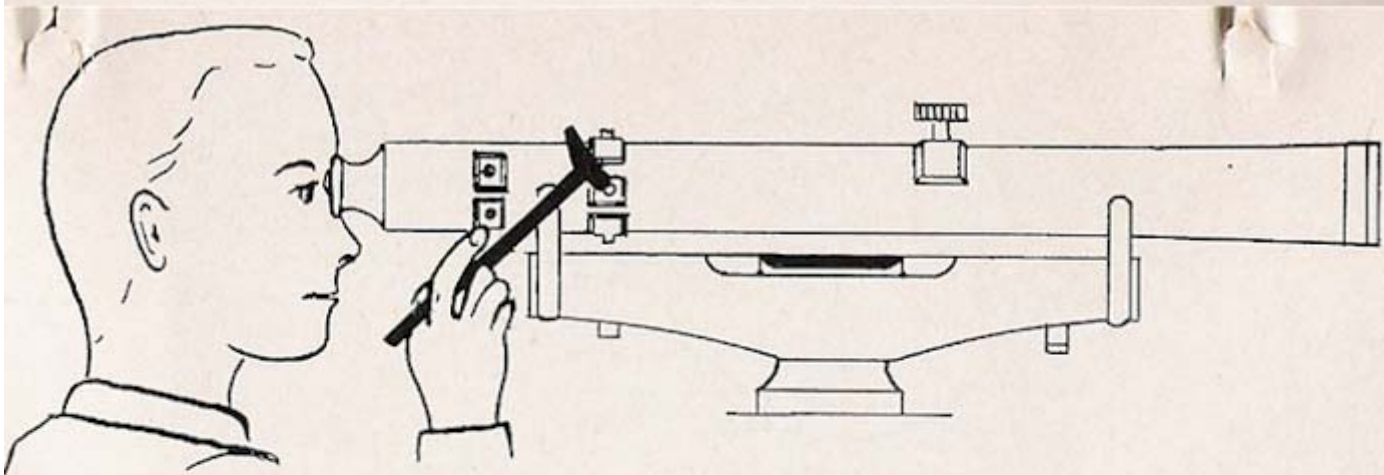
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Art. II. Setting Horizontal Wire at Right Angles to Spindle

1. Set one end of horizontal wire on convenient well-defined point. Move telescope by means of clamp and tangent screw so that point passes from one end of wire to other.

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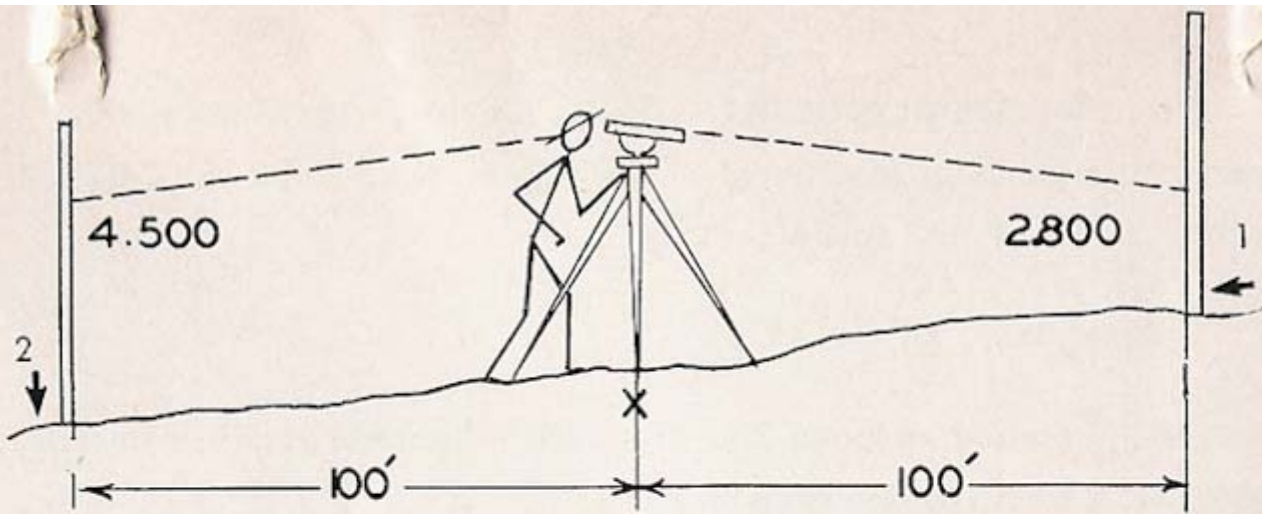


2. If point does not coincide with wire full length:

Tap screws gently to move wire. (If screws have been set too tight, it may be necessary to loosen all four slightly.)

Move wire until it remains on point full length of line.

8



Art. III. Bringing Line of Sight Parallel to Bubble

1. Set up tripod at convenient point X.

LEVEL UP ALL AROUND."

Choose a point No. 1 about 100 feet from instrument.

Take reading on rod at this point.

9

Viz.—Reading at point No. 1: 2.800. Choose point No. 2 exactly the same distance from instrument as point No. 1. (It need not be in line with point No. 1 and instrument.)

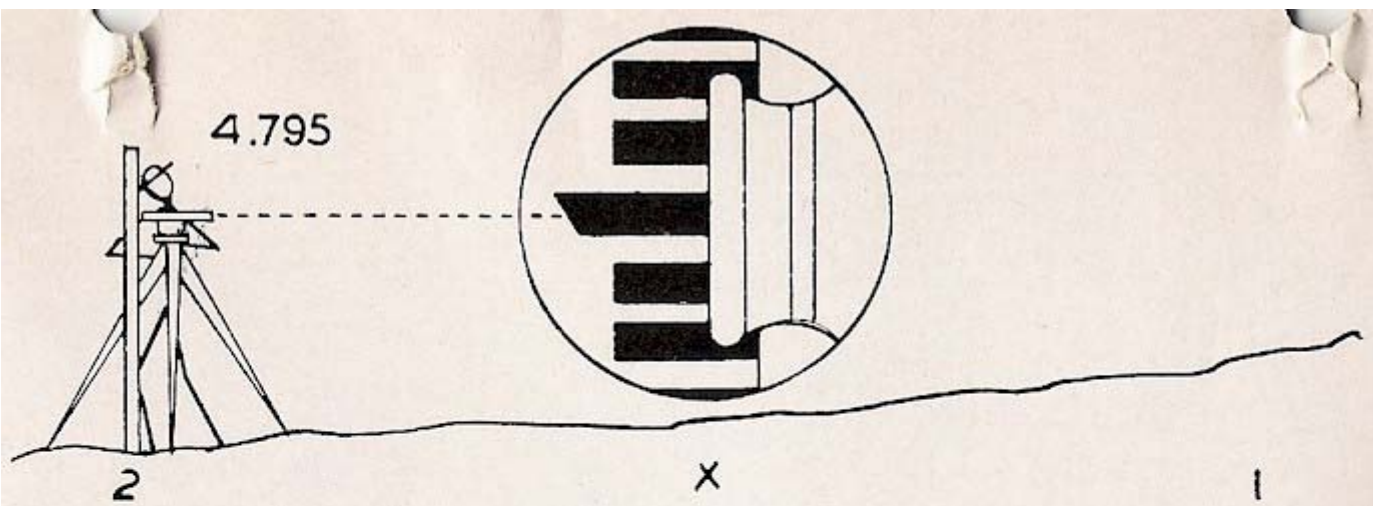
Take reading at this point.

Viz.—Reading at point No. 2: 4.500. Subtract reading on rod at point No. 2 from reading at point No. 1.

Viz. $2.800 - 4.500 = -1.700$.

This is the DIFFERENCE IN ELEVATION of the two points.

10



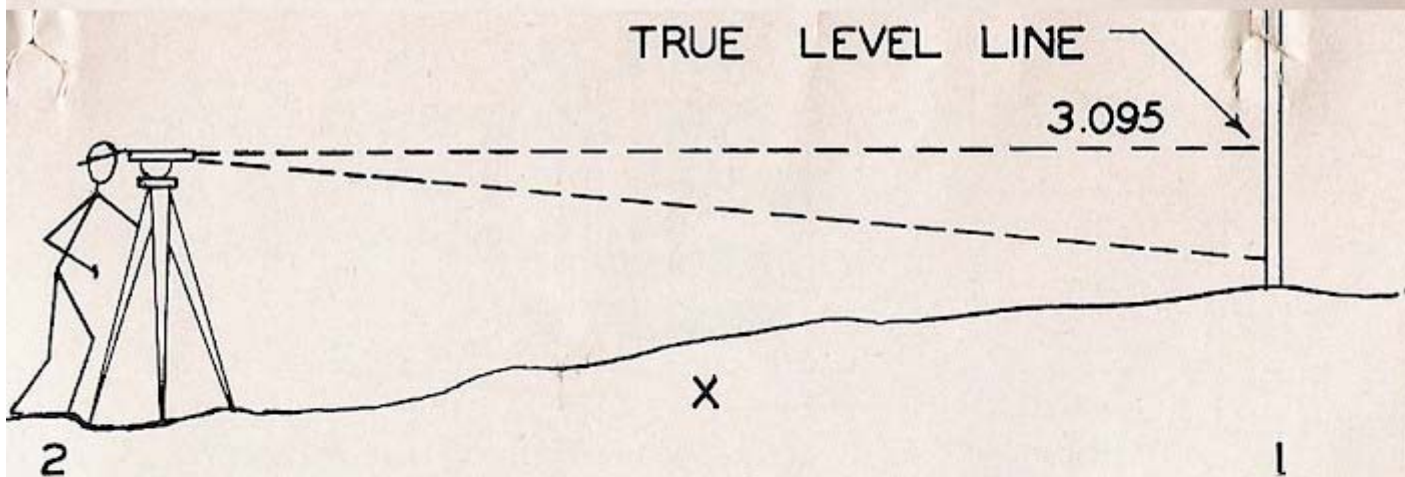
2. Set instrument close to rod at point No. 2, so eyepiece will almost touch rod.

"LEVEL UP ALL AROUND."

Measure height of instrument on rod at center of eyepiece.

Viz.—Reading: 4.795.

11



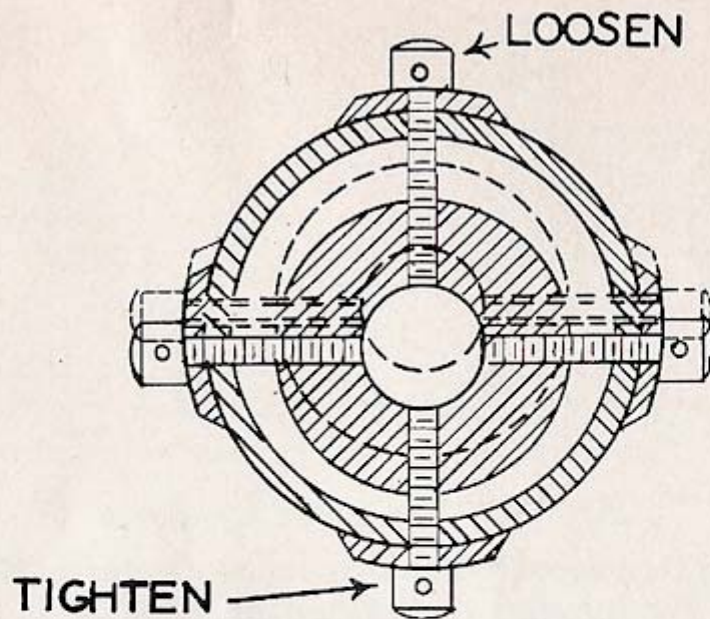
3. Move rod from point No. 2 to point No. 1.

KEEP LEVEL BUBBLE IN CENTER.

Add DIFFERENCE IN ELEVATION (-1.700) to INSTRUMENT HEIGHT at point 2, (4.795) to get TRUE LEVEL LINE for point 1.

Viz.— $4.795 + (-1.700) 3.095$.

12

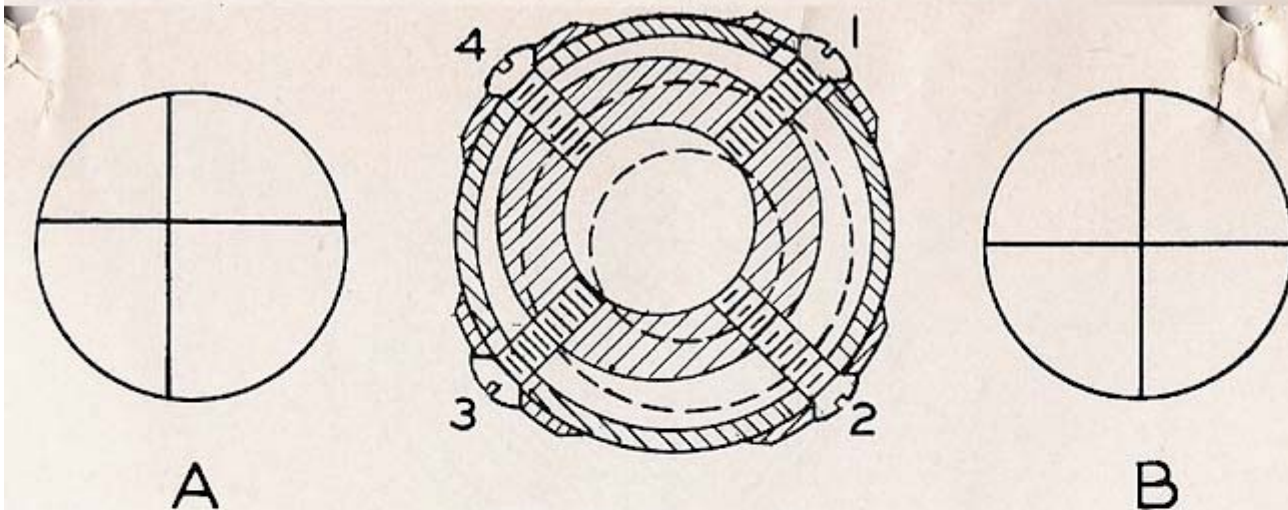


4. If cross wire appears below TRUE LEVEL LINE, loosen top screw and tighten bottom as shown.

If it appears above TRUE LEVEL LINE, loosen bottom and tighten top.

If wire is moved in either direction, it will be necessary to repeat Art. II.

13



Art. IV. To Center Eyepiece

If it is desired that cross wires appear in center of field, the eyepiece may be centered by moving the slotted screws.

Should wires appear in upper left field as shown in Diagram A, loosen screw 4, (as viewed from eye end) and tighten screw 2.

This applies to all other screws and positions.

If wires appear to be in upper right field, loosen screw 1 and tighten screw 3.

Moving these screws does not alter the adjustment of the level.

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CARE OF INSTRUMENT

Use extreme care when cleaning lenses as they are coated on the inside surfaces. Use optical tissue, or a very soft cloth—DO NOT USE A BRUSH. Usually the outer surface of the eyepiece and of the objective lens is all that requires cleaning. Keep dust cap over objective lens when not in use.

No oil or grease should be used on the focusing slide. A small amount of non-corrosive grease may be used on the eyepiece slide, leveling screws, tangent screws, and clamp screws—DO NOT USE OIL. Always remove excess grease from exposed portion of threads.

This instrument is so designed that it will automatically clean itself of any dirt sifting into the clamp. During damp weather dust may be retained in the clamp, causing a slight grinding, but after being thoroughly dried out the dust will drop on through into the base where it does no harm.

If desired, the lock ring and half ball may be unscrewed and the base plate removed, permitting the removal of the clamp and the leveling screws.

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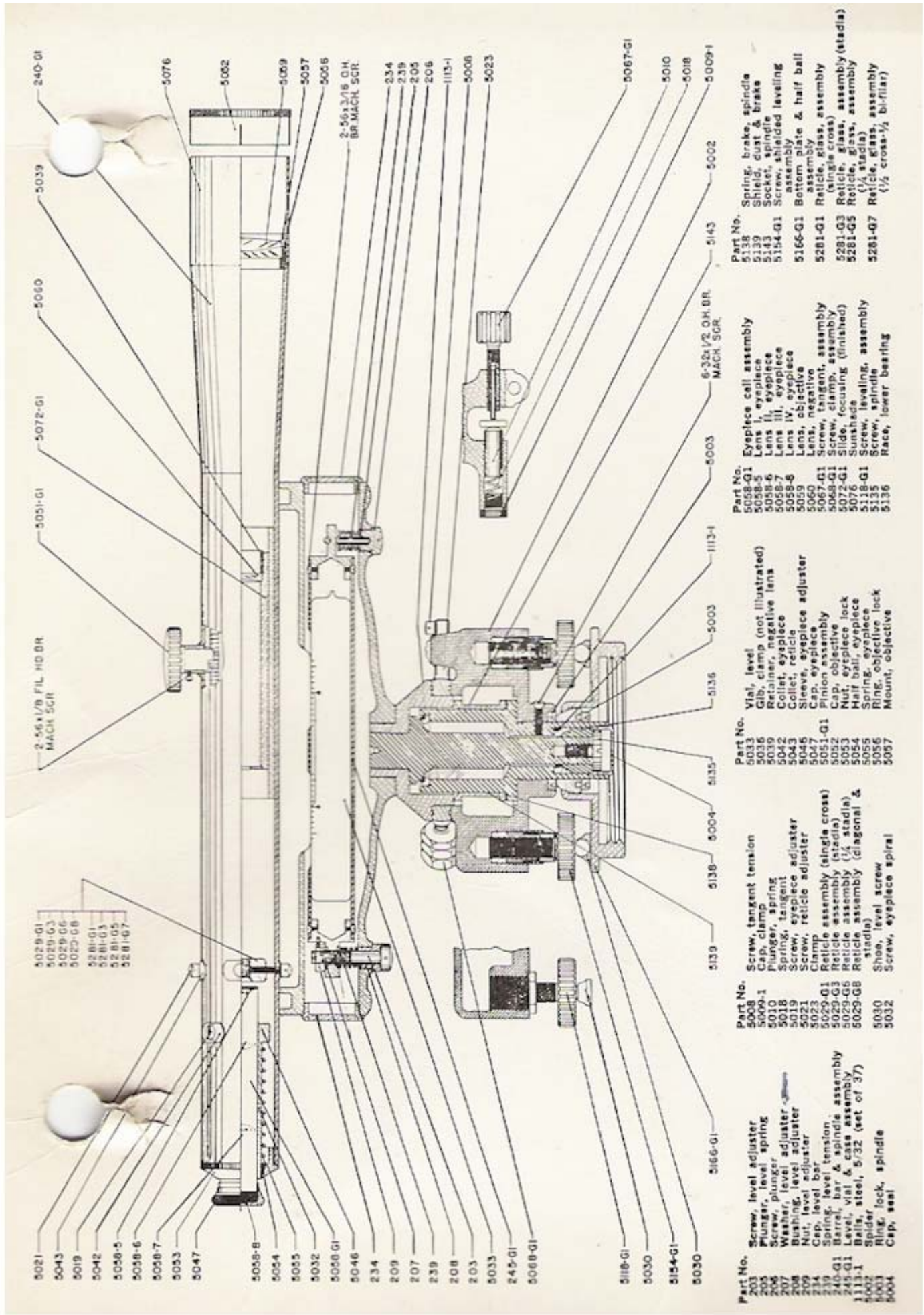
UNDER NO CIRCUMSTANCES SHOULD THERE BE ANY ATTEMPT TO UNSEAL THE SPINDLE. It is lubricated and sealed, and barring a severe accident, should remain accurate from ten to twenty years. The best policy is to do the minimum amount of cleaning. When dirt gets into the screws it can be removed with a tooth brush. Excess grease is bad. Do not use any oil on this instrument.

This patented Brunson Base with Dustproof Ball Bearing Spindle has been giving satisfactory service since first produced fifteen years ago. It guarantees accuracy and free operation in dusty atmospheres and extreme low temperatures.

All Brunson instruments are precision built to rigid specifications and are guaranteed against faulty material and workmanship. However, we stand ready at all times to make good any factory defect.

We hope that the information given in this booklet will aid you in retaining the LONGER-LASTING ACCURACY for which this instrument has been designed.

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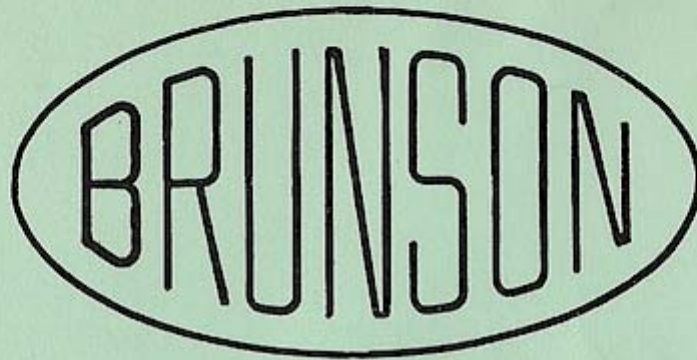


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| <p>Part No.</p> <p>203 Screw, level adjuster</p> <p>205 Plunger, level spring</p> <p>206 Washer, level adjuster</p> <p>207 Bushing, level adjuster</p> <p>208 Nut, level adjuster</p> <p>214 Cap, level bar</p> <p>234 Spring, level tension</p> <p>240-G1 Barrel, bar & spindie assembly</p> <p>245-G1 Level, vial & case assembly</p> <p>1113-1 Spider lock, spindle</p> <p>8003 Ring, lock</p> <p>8004 Cap, seal</p> | <p>Part No.</p> <p>5008 Screw, tangent tension</p> <p>5009-1 Cap, clamp</p> <p>5010 Plunger, spring</p> <p>5018 Spring, tangent</p> <p>5019 Screw, eyepiece adjuster</p> <p>5021 Screw, reticle adjuster</p> <p>5023 Clamp</p> <p>5029-G1 Reticle assembly (single cross)</p> <p>5029-G3 Reticle assembly (1/2 stadia)</p> <p>5029-G6 Reticle assembly (1/4 stadia)</p> <p>5029-G8 Reticle assembly (diagonal & stadia)</p> <p>5030 Shoe, level screw</p> <p>5032 Screw, eyepiece spiral</p> | <p>Part No.</p> <p>5033 Vial, level</p> <p>5036 Calb, clamp (not illustrated)</p> <p>5038 Retainer, negative lens</p> <p>5042 Colllet, eyepiece</p> <p>5045 Colllet, reticle</p> <p>5048 Sleeve, eyepiece adjuster</p> <p>5047 P.P., eyepiece</p> <p>5051-G1 Cap, objective</p> <p>5052 Cap, objective</p> <p>5053 Nut, eyepiece lock</p> <p>5054 Half bar, eyepiece</p> <p>5055 Spring, eyepiece</p> <p>5056 Ring, objective lock</p> <p>5057 Mount, objective</p> | <p>Part No.</p> <p>5058-G1 Eyepiece cell assembly</p> <p>5058-5 Lens I, eyepiece</p> <p>5058-6 Lens II, eyepiece</p> <p>5058-7 Lens III, eyepiece</p> <p>5058-8 Lens IV, eyepiece</p> <p>5059 Lens, objective</p> <p>5060 Lens, negative</p> <p>5067-G1 Screw, tangent, assembly</p> <p>5068-G1 Screw, clamp, assembly</p> <p>5072-G1 Slide, focusing (finished)</p> <p>5076 Sunshade</p> <p>5118-G1 Screw, leveling, assembly</p> <p>5135 Screw, spindle</p> <p>5136 Race, lower bearing</p> | <p>Part No.</p> <p>5138 Spring, brake, spindie</p> <p>5139 Shield, dust & brake</p> <p>5143 Socket, spindie</p> <p>5154-G1 Screw, shielded leveling assembly</p> <p>5166-G1 Bottom plate & half ball assembly</p> <p>5281-G1 Reticle, glass, assembly (single cross)</p> <p>5281-G3 Reticle, glass, assembly (stadia)</p> <p>5281-G5 Reticle, glass, assembly (1/4 stadia)</p> <p>5281-G7 Reticle, glass, assembly (1/2 cross-1/2 bi-filar)</p> |
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MANUFACTURERS OF



In Service all over the World

DUST-PROOF BALL BEARING SPINDLE

BRUNSON INSTRUMENT COMPANY

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Kansas City, Mo.

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45
L.O. Brown