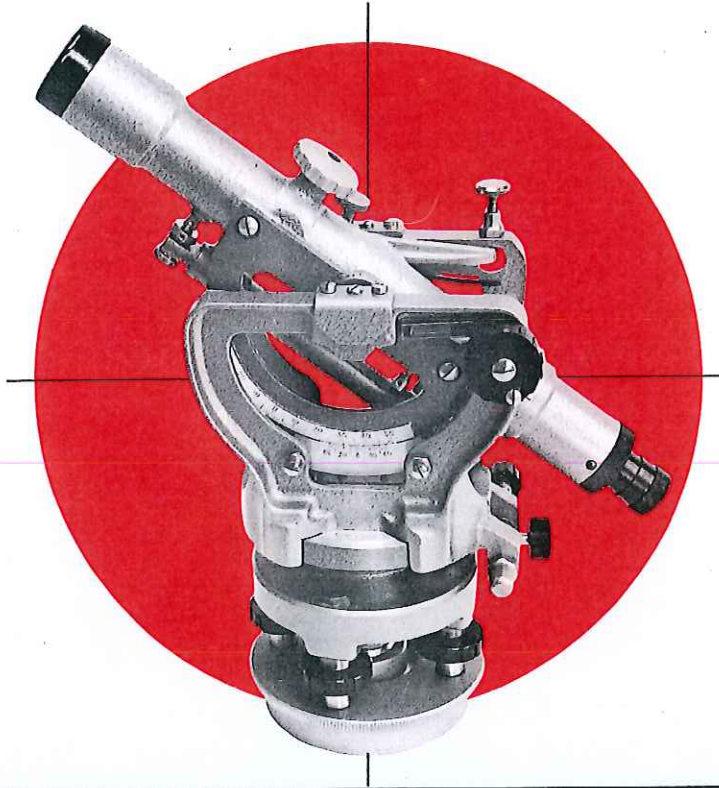




INSTRUMENT & MANUFACTURING CO.
170 E. KIRKHAM AVE. ST. LOUIS, MISSOURI 63119



• SPECIFICATIONS •
• PARTS LIST • INSTRUCTIONS •

CONTENTS

	PAGE
Foreword	3
Specifications:	
2040 Dumpy Level	4-5
2050 Transit Level	6-7
2060 Engineer's Level	8-9
2070 Dumpy Level	10-11
Parts Lists	12-13
Tripods	14-15
Leveling Rods and Lining Poles	16-17
Instructions on Using	
Handling	18
Setting Up	18
Leveling	19
Cross Hairs	19
Reading the Circle and Vernier	20
Measuring Elevation	20
Use of Intermediate Points	21
Running Straight Lines	22
Layout of Building Lines	23
Irregular Building Lines	24
Offsetting a Transit Line	25
Repairs	26
Hand Levels	26

FOREWORD

It was always my ambition to manufacture instruments of my own design and to make them as near perfect as possible for the purpose for which they were intended, using only materials proven to be superior and incorporating the highest degree of workmanship possible.

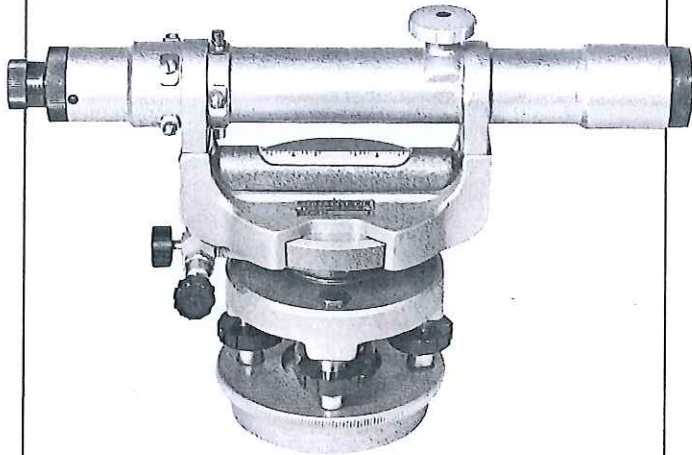
In my many years of experience in manufacturing and designing instruments as a Master Builder of Fine Optics with the Carl Zeiss Optical Works in Germany, I have decided on the instruments described in this booklet. SEILER Instrument has manufactured these instruments for years and found them satisfactory in every respect.

These instruments are used for all kinds of leveling: beginning with highway work, levee, bridge, sewer, soil erosion, drainage, and pipe line work; also for commercial and residential buildings, overland electric lines, landscape work and many more uses than can here be described.

SEILER instruments are built as strong as possible without being heavy and unhandy. All SEILER instruments carry our guarantee for excellent workmanship, superior materials and performance. We hope that every owner will be absolutely satisfied.

ERIC H. SEILER
Founder

SEILER
12" DUMPY LEVEL



No. 2040
Weight 8 lbs.

4

SPECIFICATIONS
#2040 12" DUMPY LEVEL

This instrument is especially designed for construction of buildings, roadwork, drainage, sewers, irrigation, soil conservation and any type of precise leveling. Specially selected materials make this level as strong and rugged as possible. No zinc diecastings are used. There is no other level of comparable accuracy in this price range which will withstand as much rough usage and still retain its high degree of accuracy.

TELESCOPE—12" long, erecting, internal focusing, magnifying power 24 diameter, 1¼" achromatic objective, dustproof, spiral rack and pinion focusing movement on hand lapped slide. Dependable glass cross hair, spiral eyepiece adjustment. Coated optics.

LEVEL VIAL—5" long, precisely ground to 60 seconds.
LEVEL BAR—Special alloys, constructed to protect horizontal circle, with reinforced telescope supports.

CENTER AND LEVELING HEAD—Meehanite steel, precisely fitted to exceptionally close tolerance for high accuracy leveling, long life and dependability. ⅜ inch nickelsilver leveling screws. Clamp and tangent movements.

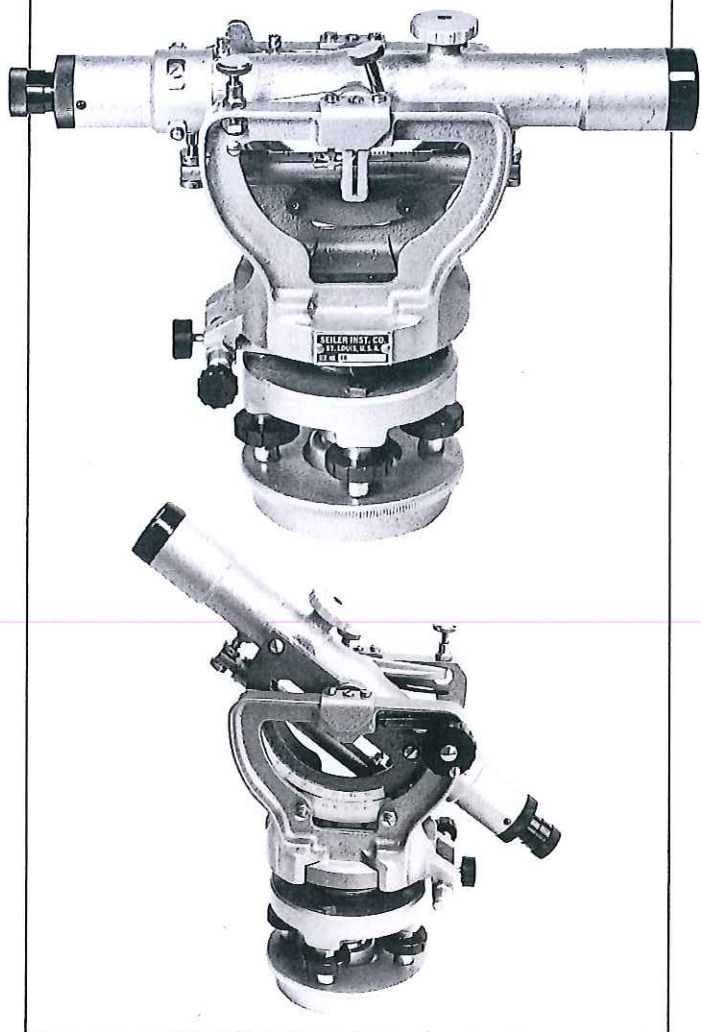
CIRCLE—4 inch, graduated on Seiler's high precision dividing machine in degrees; vernier reading to 5 minutes. Circle engraved in quadrants.

BASE PLATE—U. S. Standard 3½ inch, 8 threads, shifting center.

FINISH—Sharkskin tan, baked on enamel, smooth finish.
EQUIPMENT—Fine hardwood case with strap, sunshade, adjusting pins, plastic cover and plumb bob.

5

SEILER
12" BUILDER'S LEVEL



6

SPECIFICATIONS
#2050 BUILDER'S TRANSIT LEVEL

Designed especially as a complete all around builder's and architect's instrument. In its construction, particular care has been taken in the design and machining of the telescope locking device, which converts this instrument from level to transit position. Constructed of the finest reinforced bronze castings, combined with first quality optics and workmanship. We believe this to be the most dependable and accurate builder's instrument on the market.

No zinc diecastings are used.

We recommend this instrument for construction, road and highway work, drainage irrigation, pipe line and excavation work.

TELESCOPE—Coated Optics, 24 Power, internal focusing by rack and pinion. Dependable glass cross hair, spiral eyepiece adjustment. Rugged cast bronze, accurately machined, aligned and assembled.

TELESCOPE LOCKING MECHANISM—Tapered wedge engages matching seats on two sides for highest accuracy and repeatability.

LEVEL VIAL—6" long. Ground to 110-seconds.

MATERIALS—Selected alloys of bronze, brass, steel and nickelsilver for exceptional strength.

CENTER AND LEVELING HEAD—Meehanite steel, precisely fitted for high accuracy leveling, long life and dependability. Clamp and tangent movements.

LEVELING SCREWS— $\frac{3}{8}$ inch nickelsilver, fully enclosed to help prevent dust and dirt in these precisely fitted parts and to insure ease of operation.

CIRCLE AND ARC—Graduated and engraved on Seiler's precision dividing machine in degrees; verniers reading to 5-minutes.

BASE PLATE—U.S. Standard $3\frac{1}{2}$ "—8 thread, bronze, with shifting center.

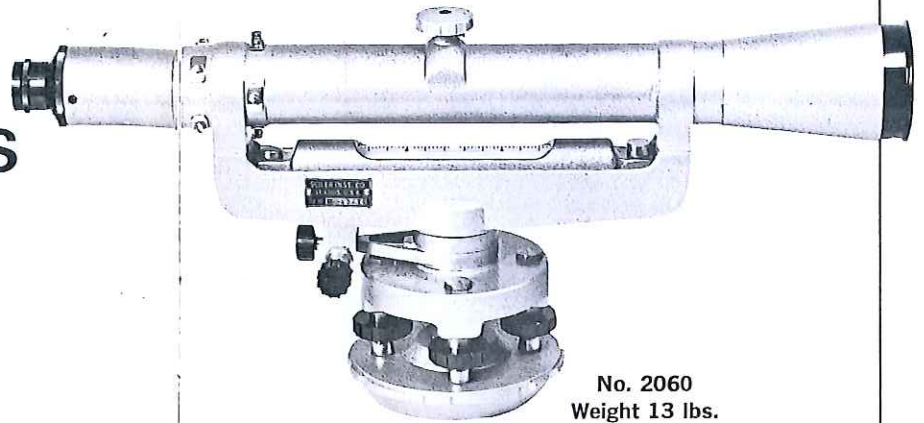
FINISH—Sharkskin tan, baked on enamel, smooth finish.

HARDWOOD CASE—Strap, sunshade, plumb bob, adjusting pins, plastic cover, clear finish.

7

SEILER

18" ENGINEER'S DUMPY LEVEL



No. 2060
Weight 13 lbs.

SPECIFICATIONS

#2060 18" ENGINEER'S DUMPY LEVEL

The Seiler 18" Engineer's Dumpy Level is especially built for precise leveling in highway construction, bridges, dams, levees, irrigation and heavy construction work.

The #2060 Dumpy Level is constructed from the finest materials available. All castings are reinforced bronze. Metals have been proved throughout the years as most suitable for surveying instruments.

No zinc diecastings are used.

TELESCOPE—18 inches long, internal focusing, erecting, magnifying power 35.7 diameters, 2" achromatic objective, 1 degree 4 minutes field of view, achromatic eyepiece. Dustproof rack and pinion movement on precision fitted focusing slide. Dependable glass cross hair, spiral eyepiece adjustment. Coated optics. Focusing range 8 feet to infinity.

8

LEVEL VIAL—8 inches long, precisely ground to 20-30 seconds, mounted in bronze cast housing, all adjustments are between ball washers to eliminate possible strain.

LEVEL BAR—Reinforced bronze casting designed and constructed to give maximum strength and protection to level housing.

CENTER AND LEVELING HEAD—Meehanite steel, precisely fitted to exceptionally close tolerance for high accuracy leveling, long life and dependability. $\frac{3}{8}$ inch nickelsilver leveling screws. Clamp and tangent movements.

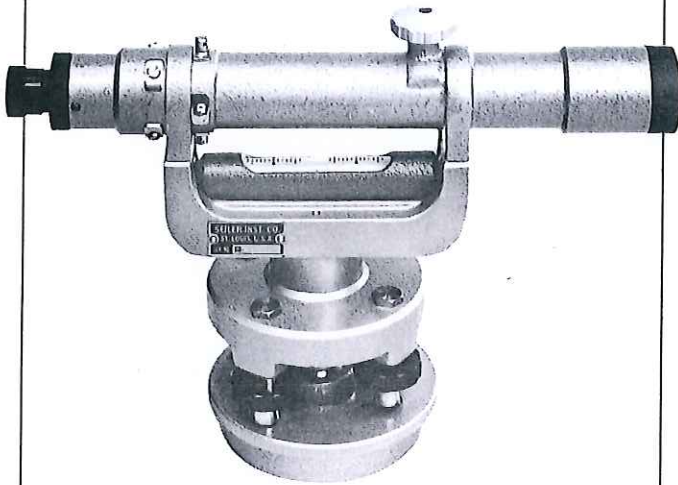
BASE PLATE—U.S. Standard $3\frac{1}{2}$ ", 8 threads.

FINISH—Sharkskin tan, baked on enamel, smooth finish.

EQUIPMENT—Lock-cornered mahogany box, leather strap, snap lock, plastic cover, sunshade and adjusting pins.

9

SEILER
**PLAIN 12"
DUMPY LEVEL**



No. 2070
Weight 7 lbs.

SPECIFICATIONS
#2070 PLAIN 12" DUMPY LEVEL

To supply an inexpensive instrument for leveling purposes only, where no layout work is needed. The Seiler #2070 Dumpy Level is well suited for leveling foundations, road-work, drainage, and sewer work. This instrument is widely used in irrigation and soil conservation work. Built as strong and rugged as possible, using only reinforced bronze coatings and other metals.

No zinc diecastings are used.

There is no other level in this price range and of such accuracy on the market, which will withstand as much rough usage and still retain its high degree of accuracy.

TELESCOPE—12" long, erecting, internal focusing, magnifying power 24 diameter, 1¼" achromatic objective. Dustproof, spiral rack and pinion focusing movement on hand lapped slide. Dependable glass cross hair, spiral eyepiece adjustment. Coated optics.

LEVEL VIAL—5" long, precisely ground to 60 seconds.
LEVEL BAR—Reinforced bronze, constructed to protect horizontal circle, with reinforced telescope supports.

CENTER AND LEVELING HEAD—Meehanite steel, precisely fitted to exceptionally close tolerance for high accuracy leveling, long life and dependability. ⅜ inch nickelsilver leveling screws. Clamp and tangent movements.

BASE PLATE—U.S. Standard 3½ inch, 8 threads, shifting center.

FINISH—Sharkskin tan, baked on enamel, smooth finish.

EQUIPMENT—Fine hardwood case with strap, sunshade, adjusting pins, plastic cover and plumb bob.

2070—Same as 2040 but without horizontal circle and tangent.

PARTS LIST

All corresponding parts are numbered the same, whether on the 2040 12" Dumpy Level, 2050 12" Transit Level, 2060 18" Engineer's Dumpy Level, or 2070 12" Plain Level. Therefore pictured is only one instrument with part numbers.

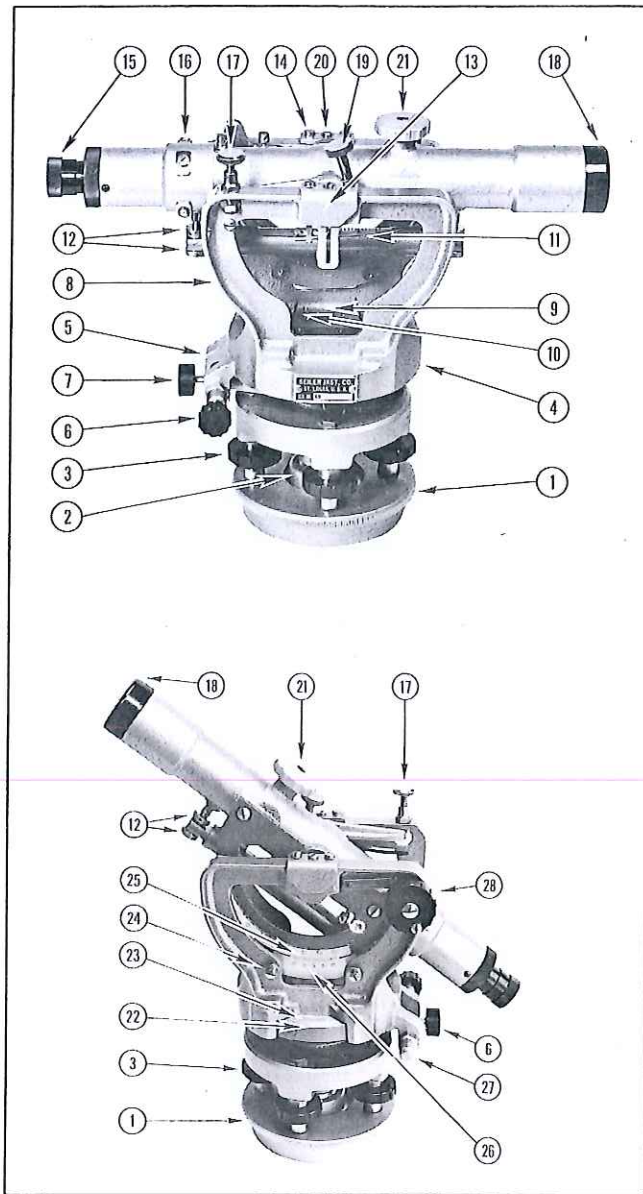
For example, if ordering leveling screws, No. 3 is the number which coincides with leveling screws on all instruments. A horizontal tangent screw is No. 6 throughout the line. It is necessary to list catalog number and part number when ordering parts, as there are differences in sizes.

For example:

Cat. #2060 18" D. Level part 21 Pinion

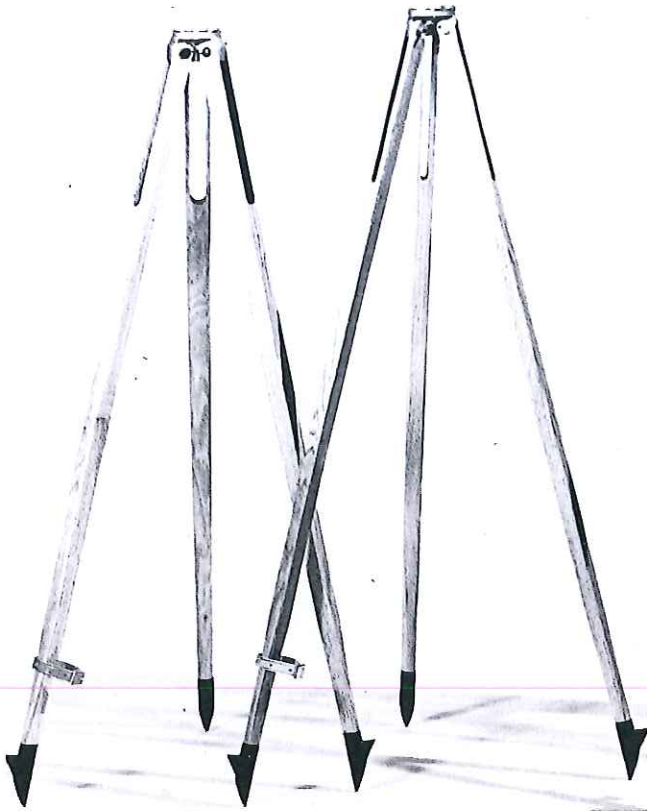
Cat. #2040 12" D. Level part 15 Eyepiece cap

- No. 1. Baseplate
 2. Shifting plate
 3. Leveling screw
 4. Top plate or cross bar
 5. Horizontal tangent
 6. Horizontal tangent screw
 7. Horizontal clamp screw
 8. Standards
 9. Control level
 10. Control level adjusting screw
 11. Telescope level
 12. Telescope level adjusting nuts
 13. Telescope axis cap
 14. Standard cap screw
 15. Eyepiece cap
 16. Eyepiece adjusting screw
 17. Vertical tangent screw
 18. Objective lens
 19. Vertical clamp screw
 20. Telescope axis adjusting screw
 21. Telescope focusing pinion
 22. Horizontal graduated circle
 23. Horizontal vernier
 24. Vertical vernier adjusting screw
 25. Vertical arc
 26. Vertical arc vernier
 27. Tangent cap
 28. Lock



SEILER

2090 and 3000 TRIPODS



No. 2090
13 lbs.—59"

3000
12½ lbs.—61"

Seiler tripods have bronze heads, accurately machined to assure a perfect fit for virtually all instruments. Sections are straight grained, selected hardwoods.

Models 2090 and 3000 are standard, stiff leg, with extra large spur, cast iron shoe. Model 3000 is recommended for all Builöer's instruments. Both have U.S. Standard 3½" — 8 thread head.

SEILER

3100 and 3101 TRIPODS



3100
12½ lbs.—62"

3101
13 lbs.—40" to 62"

Models 3100 and 3101 are wide frame, available with either "A" head 3½"—8 thread (for American made instruments) or "E" head 5/8"—11 thread (for European made instruments). Please specify. One minute—quick change—adapter kit available.

Accessories Available — Plumb Bob Kit

3½"—8 Adapter Kit #3100-1085

5/8"—11 Adapter Kit #3100-1081

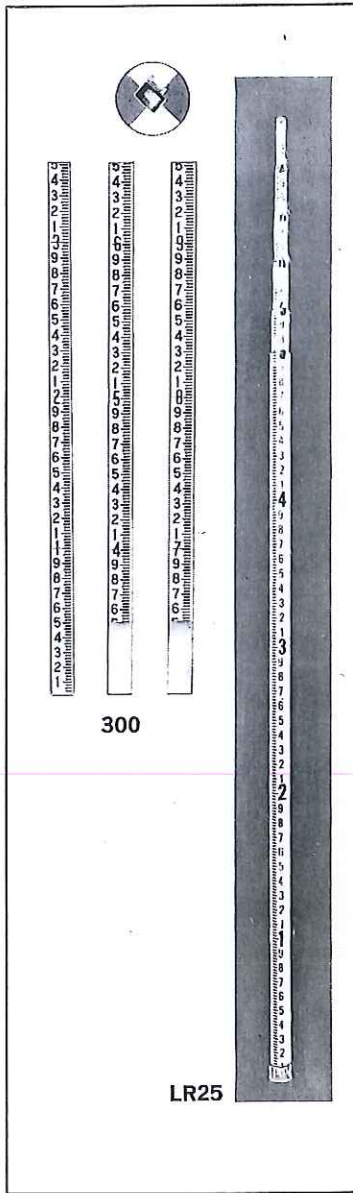
3½"—8 Protective Aluminum Cap

5/8"—11 Protective Aluminum Cap

ARCHITECT'S LEVELING RODS

#300 Joined Rod either 12½' 3 section or 16½' 4 section. Feet, tenths and hundreds.

#LR25
Fiberglass Rod 25'
Feet, tenths and hundreds



300

LR25

LEVELING RODS and LINING POLLS

#53-2131
Philadelphia rods ranging from 7 to 13 feet graduated in feet, tenths and hundreds.
2 section

#381 lining poles—three section, 1¼ inch diameter, 12½ feet long.

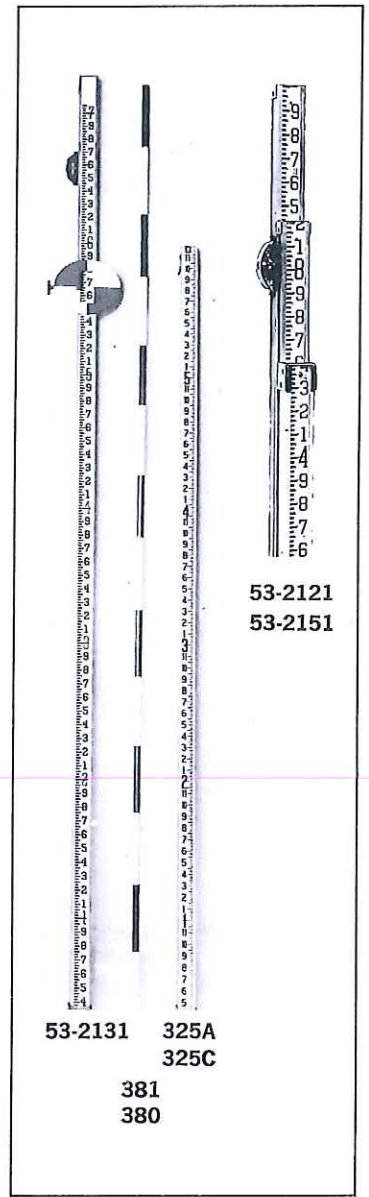
#380 Same as above except 8¼ feet long

#325A, architects' and builders' leveling rods from 6 to 11 feet graduated in feet, tenths and hundreds.

#325C Same as #325A, except graduated in feet, inches and eighths.

#53-2121
Frisco Rod 4½-12'
Feet, tenths and hundreds

#53-2151
Frisco Rod 5½-15'
Feet, tenths and hundreds



53-2121
53-2151

53-2131 325A
325C

381
380

INSTRUCTIONS

Handling of Instruments

All surveying instruments, no matter whose make, how cheap or expensive, need proper care for satisfactory operation. We are not able to make instruments strong enough to withstand all kinds of abuse and still remain in perfect adjustment. Therefore, it is advisable to handle all instruments as carefully as possible to have satisfactory results and eliminate unnecessary repairs. SEILER instruments are built with strong materials, and are constructed in such a way that, by reasonable handling, they will keep their adjustment and operate satisfactorily.

Setting Up Tripod and Instrument

When plain leveling, you may set up your instrument any place within sight of all points to be leveled. For reading angles, the instrument must be placed right over the point and centered with help of the plumb bob. Place your tripod on the right location, being careful that legs are far enough spread to provide a solid support for instrument. By help of the spurs on the tripod shoes, step tripod securely into the soil. Remove tripod cap and take instrument carefully out of carrying case and place on top of tripod head, screwing against its base. Now you are ready for leveling your instrument.

ON USING

Leveling the Instrument

The next operation is the careful leveling of the instrument before taking any reading. After the instrument is carefully leveled, all readings taken on the horizontal cross-hair are in level, no matter how close or distant the object may be. To level the instrument, always use the telescope level for final leveling because it is the most sensitive level on all instruments. Turn your telescope so it is over one set of leveling screws and bring the bubble to the center of the level vial by means of the leveling screws by tightening one and loosening the opposite screw. Use both hands simultaneously for this operation. Be sure there is sufficient tension on the screws to retain level.

Repeat the same operation over the other set of leveling screws. In doing this, the first leveling may be out again. Keep repeating the operation over both sets of leveling screws until level bubble remains in center. With a little experience these operations can be done quickly and practically automatically. Now your instrument is in level and may be used for any work you desire.

Cross Hairs

In telescopic instruments all measuring is done by a fine cross-hair on the inside of the telescope. This cross-hair is centered in the line of collimation by four capstan head screws on the outside of the telescope. Moving one of these screws by unskilled hands will throw the instrument out of collimation. On figure number 1 you will find hair line A-B is called the horizontal cross-hair. The line C-D is called the vertical cross-hair. The cross-hair is adjusted in the telescope. When the instrument is leveled properly, it forms an absolutely vertical and horizontal line. The cross-hair is focused with the eye-piece cap by turning it either left or right until the cross-hair appears black and sharp in the telescope.

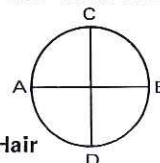


Fig. 1 — Cross Hair

Reading the Circle and Vernier

On SEILER Builder's instruments, the horizontal circle and vertical arc are graduated to single degrees.

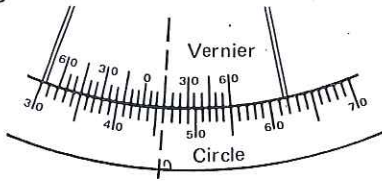


Fig 2 — Horizontal and Vertical Vernier

By means of a vernier you are able to read the circle to 5 minutes of an arc. We use the open double vernier. Your 5 minute reading will be taken in the direction you turn the angle. On figure number 2, above, the horizontal vernier reads 46 degrees and three more lines of 5 minutes each, making a total of 46 degrees and 15 minutes. In reading a double vernier be careful that you always use the side of the vernier in the direction of your angle. The double vernier has the advantage that all minute readings can be done on either side.

Measuring Elevation

Before taking levels, check instrument to be sure it is properly leveled. To obtain the differences in elevation between two points we will call A and B (see Fig. 3), set rod on point A, being careful that the rod is vertical. Make reading, using the focusing pinion (knob) on the telescope for focusing. The horizontal cross-hair intersects the rod at the 6 foot mark. Then place the rod on point B. The reading is 6½ feet, a difference of ½ foot, showing that the ground level at point B is ½ foot lower than at point A.

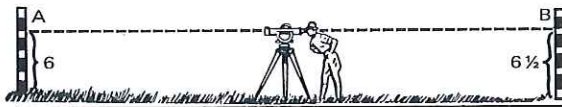


Fig. 3

Use of Intermediate Points

When obstructions, irregularity of the ground, or a large difference in elevation is to be determined, and point B can not be sighted from point A, intermediate points must be used. See Fig. 4. Set up level at a convenient distance from A (Int. point). Make readings on rod at A and C. With the rod remaining on C, move instrument to another point (Int. point 2). Take readings on rod at C and D. Again move instrument to new location with rod remaining on D and make readings on rod at D and B. Now that the difference in elevation between all points A and C, C and D, and D and B have been recorded, it is easy to figure the difference in elevation between A and B. Perhaps the easiest way is to call all readings toward A back-readings and mark them plus (+) and all readings toward B forward-readings, designated by minus (—).

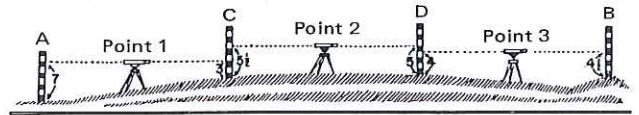


Fig. 4

Add all plus readings and then all minus readings as shown and subtract the total

Plus 7	Minus 3
Plus 5½	5
Plus 4	4½
Total plus 16½	minus 12½

The difference in elevation on Fig. 4 between point A and B is:

plus 16½ feet
minus 12½ feet
plus 4 feet

4 feet is the difference between A and B.

Running Straight Lines

Running straight lines over level or rolling ground can only be accomplished with our #2050 Builder's Transit or other transit. For this operation the telescope must be able to rotate on its horizontal axis. Again the instrument must be leveled carefully as in any other operation. Set up instrument over point A and, with the help of the plumb bob and shifting-plate, center the instrument exactly over the point from which line should be extended. By releasing telescope out of its horizontal position or releasing clamp or lock (as on our Transit Level), the telescope will travel in the vertical plane. In this position, sight point B with the vertical cross-hair. With the help of the clamp and tangent for fine setting, bring vertical hair exactly on point. By tilting telescope in either direction, any point which is cut by the vertical hair is now in a straight line between A and B (see Fig. 5) also any point extended beyond B. This operation is indispensable for laying out building or lot lines.



Fig. 5

Laying Out Building Lines

In Fig. No. 6, the line A-B represents the street line and point N is the point at which the line forming the side of the building intersects the street line. If point C has not already been determined, set up and level the instrument directly over point N, and with the instrument in transit position, place the vertical cross-hair exactly on the street line. With the instrument clamped in this azimuth position, move the graduated circle so that the zero lines of circle and vernier meet. Now turn your telescope 90 degrees to the right over N. The vertical cross-hair of the instrument will now cut across points C and F. Measure the distance N-C, which is the distance from the corner of the building to the street line; and also the distance C-F along this line, and place a stake at each of these points. If the points C and F are not in the proper relation to the limits of the lot, offsetting can be used to effect the proper relation. Next set up and level the instrument directly over point C and lining up the vertical cross-hair on point F, turn an angle of 90 degrees to the left to establish the line C-D. Measure out the distance and place stake at point D. Next set up and level instrument over point D. Set vertical cross-hair on point C, turn an angle of 90 degrees to the left to establish line D-E. Measure off distance D-E. To check the work for accuracy, set up and level the instrument over point E. Set vertical cross-hair on point D and turn an angle

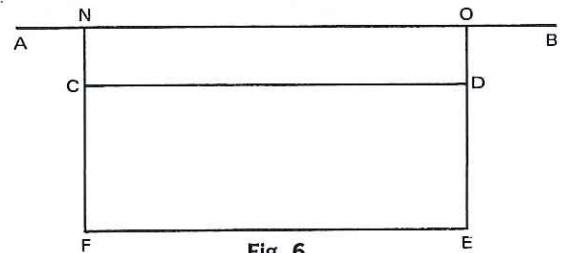


Fig. 6

of 90 degrees to the left. This line should fall directly across point F. Also measure the distance E-F, which should be equal to distance C-D. If either of these checks fail, an error has been made, either in the measurements or in turning the angles. The work must be repeated until it checks off correctly within an allowable limit of error.

Irregular Building Lines

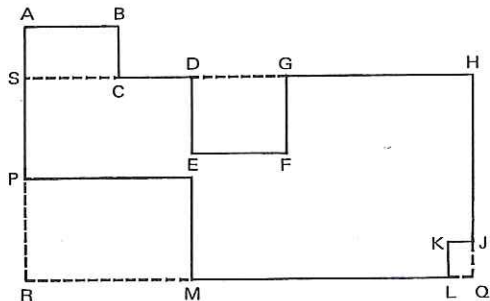


Fig. 7

Where the outline of the building is other than rectangular, the procedure is just the same from one point to the next. However, more points have to be provided, and the final proving of the work is more likely to show a small error. It is usually advisable with an irregularly shaped building such as shown in Fig. 7, to lay out, first, a large rectangle which will comprise the entire building or the greater part of it. This is shown as the rectangle H-Q-R-S in our illustration. Having once established this rectangle, the remaining parts of the lay-out will consist of small rectangles, each of which can be laid out by itself and checked separately. The small rectangles shown in the illustration have been laid out in this manner.

Offsetting a Transit Line

It is sometimes necessary to offset a transit line to produce a line beyond some obstacle. To produce the line A-B on our illustration, Fig. 8, beyond a house located between B and C, locate point B on the line (as near as practical to the house) and set up the instrument at this point. Turn the right angle A-B-F. B-F is made a convenient distance which will bring the auxiliary line beyond the building. In the same way, set up point E on the auxiliary line opposite point A. Measure A-E equal to B-F. Then set instrument at point F. Sight carefully on E. Turn instrument 180 degrees to establish the line E-F-G-H. Then move instrument to point G, turn right angle to C and measure the distance G-C which should equal distance B-F. Establish the point D on the transit line in the same manner in relation to the point H. Then, by setting up at C, and sighting ahead on D, the transit line is again run forward in its original location. Angles B-F-E and G-C-D should then be right angles.

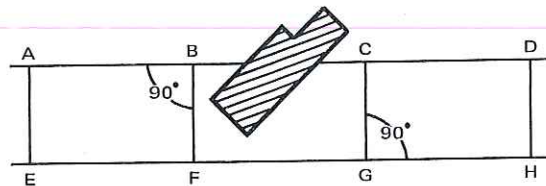


Fig. 8

REPAIRS

In case repairs are needed, any competent instrument repair shop should be able to repair SEILER instruments satisfactorily, or you may send them direct to our factory and we will give you an estimate or repair, as instructed.

LOCKE HAND LEVEL



#2080. For preliminary and estimate work the Locke Hand Level is an indispensable instrument. The time it saves in only one estimate is worth more than the cost of the instrument itself.

SEILER handles Kuker-Ranken Hand Levels and finds them to be accurate and well liked.

Six inches long with adjustable eye piece focusing level bubble, complete in sewed leather case with belt loop.



170 E. KIRKHAM AVE.
ST. LOUIS, MISSOURI 63119
Telephone (314) 968-2282