

**A.S. ALOE CO.**

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513 OLIVE STREET



**SAINT LOUIS**

MISSOURI

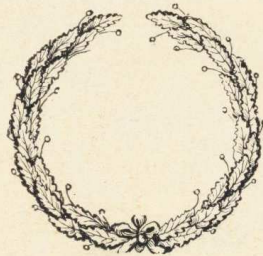


ASTRONOMICAL AND TERRESTRIAL  
TELESCOPES

OPERA GLASSES, FIELD GLASSES

AND

PRISM BINOCULARS



MB

A. S. ALOE CO.

513 OLIVE STREET

ST. LOUIS

MANUFACTURERS AND IMPORTERS



**F**OR over thirty-five years we have been manufacturers and importers of high grade Optical Instruments. Our excellent manufacturing facilities and foreign connections enable us to offer Opera Glasses, Field Glasses and Telescopes in unusual variety and at the most reasonable prices consistent with the highest grade workmanship. This catalogue, while it does not cover all the types of instruments we can supply, will afford some idea of our extensive stock. We will gladly submit estimates for furnishing special Telescopes upon receipt of specifications.

Among those not familiar with the subject there is a prevalent idea that a large telescope is required for astronomical observations. The fact is, this most interesting study can be made fascinatingly instructive with even the smallest hand telescope described in this catalogue.

Correspondence will receive prompt attention.





## ACHROMATIC TELESCOPES

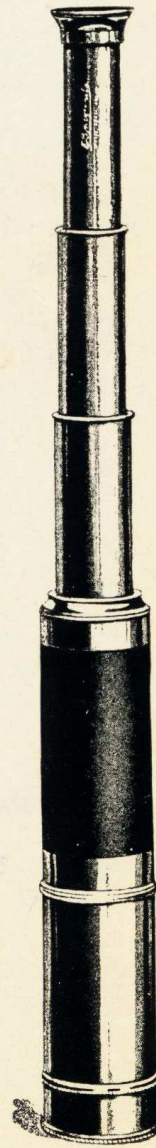
Black Morocco leather and polished brass body, three brass draw tubes, brass cap for objective lense and sliding protection for ocular, in leatherette case. An excellent telescope for tourists at the sea side or in the mountains.

Dimensions.		Magnifying Power.	Diameter Object Lens.		Price No. 3200	Price No. 3201
Extended.	Closed.		Diameters.	Lignes. Inches.		
15 inches	5 1/2 inches	10	10	10/11	\$2.25	\$2.50
16 "	5 3/4 "	11	11	1	2.50	3.00
17 "	6 1/2 "	12	12	1 1/11	2.75	3.25
17 1/2 "	6 1/2 "	14	13	1 2/11	3.00	3.50
18 1/2 "	7 "	16	14	1 1/4	3.25	3.75
23 1/2 "	9 1/2 "	20	16	1 1/2	4.50	5.25
30 "	10 1/2 "	25	19	1 3/4	5.50	6.50
36 "	11 "	30	22	2	9.50	11.50
44 "	13 "	35	25	2 1/4	15.00	17.00

SAME AS 3200, BUT WITH BRASS SUN SHADE.



3200



3201

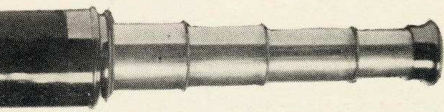


high quality superior lenses having four highly  
 set in eyepiece for examining the sun.

ing power, meters.	Diameter Objective Lens.	Range of Vision.	Price.
40	22 lignes	14 miles	\$13 50
45	25 "	18 "	20 00
50	27 "	22 "	27 50



observations can be fitted to 25 and 27 ligne



3214

a high quality superior lenses, polished mahog-  
 tubes and sun glass set in eye piece for exam-  
 ended for extra high power.

ing power, meters.	Diameter of Objective Lens.	Range of Vision.	Price
45	22	18 miles	\$18 00
50	25	22 "	25 00
55	27	25 "	32 50

observations for the above telescopes, giving a

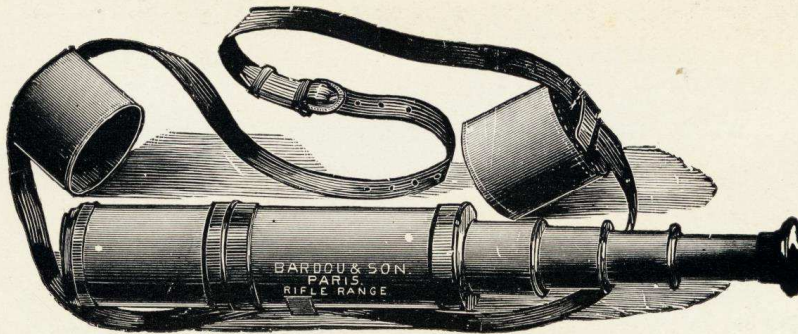




**BARDOU RIFLE RANGE TELESCOPE**

Made by Bardou & Son, Paris, France.

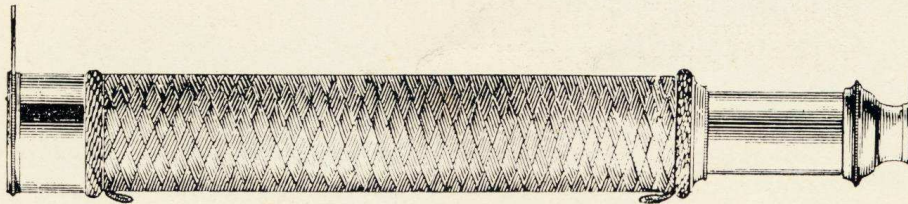
High Power and Very Convenient for Tourists.



3220

No. 3220. Bardou, 22 ligne, 2-in. object lens, black calf leather body, oxidized metal trimmings, with leather covered sun shade, leather caps and strap, power 35 diameters, four draw tubes; length closed, 11 inches; extended, 36 inches.

Price .....\$25 00



3222

Black calf leather body, one brass tube with day and night adjustment by shortening and lengthening the small tube inside. Sliding shutters protecting the eyepieces and object lens.

No.	Length		Power, Diameters.	Objective Lens,		Price.
	Extended.	Closed.		Lignes.	Inches.	
3222	42 inches	22 inches	25	22	2	\$23 00
3223	44 "	24 "	30	25	2 1/4	34 00

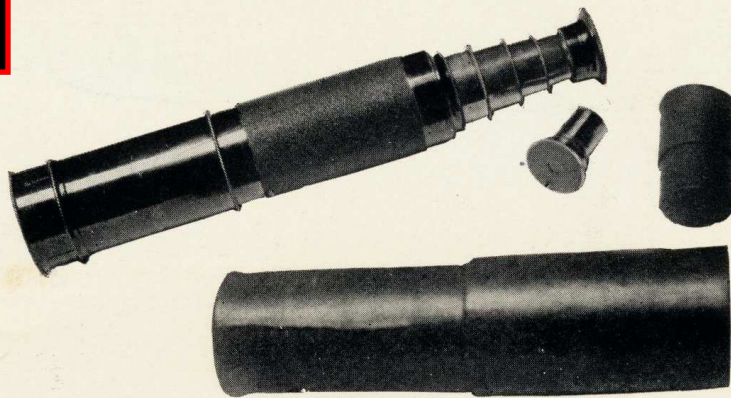


The leading professional and amateur astronomers are unanimous in awarding us the highest praise for the quality of our telescope. The immense number of duplicate orders and unsolicited testimonials constantly received, speak for their value and construction more than we can say. Read in the **Word and Works** the recommendations and praise given it by its editor, Professor Irl R. Hicks.

## ALOE'S RENOWNED DOUBLE COMBINATION TELESCOPE

STANDARD OF THE WORLD FOR QUALITY

WITH HIGH POWER ASTRONOMICAL EYEPIECE.



3300

No. 3300. Price.....\$18 00

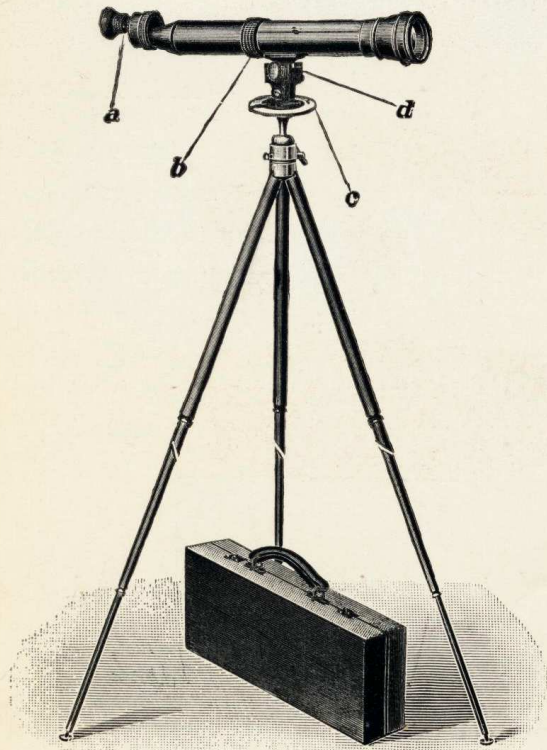
This instrument, without the additional parts, has six best quality lenses of such remarkable power and definition that it will distinguish hills at twenty-five miles, flags at twenty miles, windows and moving objects at ten, and time by a church clock at three to five miles distance, depending, of course, upon the clearness of the atmosphere. In addition to this, there is a separate powerful astronomical eye piece, which can be attached and enables the owner to examine the stars, namely: Jupiter and its four outer moons, and by adding the sun glass, also supplied, the spots in the sun. It also divides Zeta in Ursa Major, shows Saturn and its ring, many double stars and some clusters. In clear weather the astronomical eye piece can be used instead of the day one for ordinary purposes, thus giving much greater power.

The Telescope is made with four brass draws, highly burnished; sun shade to object glass and black morocco body, complete in case. Size of object glass is 22 lignes, or 2 inches. This is a new and special design giving a wide field and clear definition, and is selling very rapidly. The instrument is 36 inches long when open, and about 10 inches when closed. WE ARE THE ONLY MAKERS AND IMPORTERS OF THIS CLASS OF TELESCOPES, AND THE SAME QUALITY CANNOT BE OBTAINED ELSEWHERE. For astronomical purposes, it is imperative and necessary to have a stand for the use of the instrument, if any good results are to be obtained, and for this we recommend either the new and improved telescope stands, or the screw clamp, which is a very good article, that can very easily be screwed either in the window sill, post or doorway. See Pages 19 and 20 for descriptions.



**PRISM TERRESTRIAL TELESCOPE**

The telescope tube and the Alt-Azimuth Mounting are made of aluminum.



3310

Complete with Alt-Azimuth Mounting, Folding Metal Tripod and Carrying Case.

- a. Adjustable Eyepiece.
- b. Telescopic Drawtube.
- c. Marking Disk.
- d. Alt-Azimuth mounting with locking device.

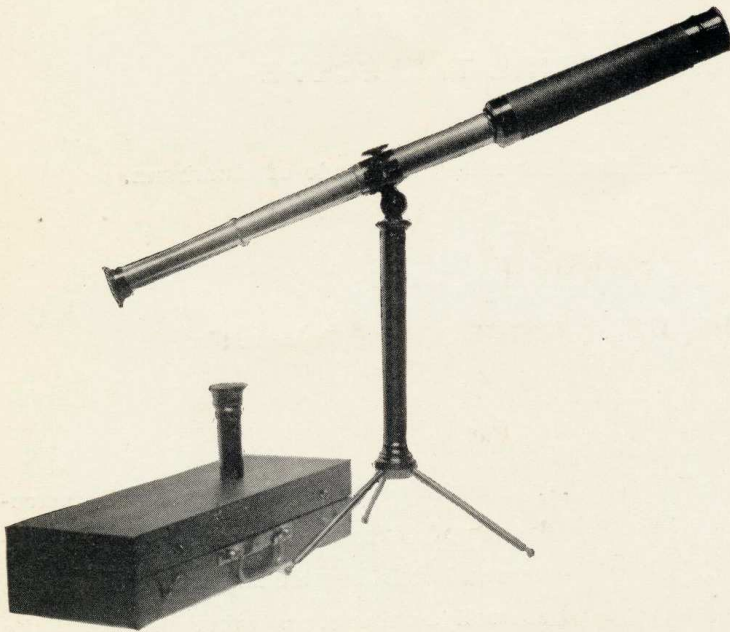


For those who require a portable instrument of extreme power; for summer homes, hotels, seaside and mountain resorts as well as numerous other purposes, the Prism Telescope will serve its purpose well.

**SPECIFICATIONS.**

- Objective, Clear Apereture, 2 inches.
- Powers, 3 Eyepieces, 24-40-50 diameters.
- Length of telescope when opened 19 in.
- Weight of telescope 28 oz.
- Weight of tripod and alt-azimuth mounting 2 ½ lbs.
- Weight complete in carrying case 9 ¼ lbs.
- Size of case 17x6 ½x3 ¼.
- Price complete.....\$100 00





3312



Aloe's Tourist Telescope the most compact astronomical telescope on the market.

19 lignes, 1  $\frac{3}{4}$  in. objective.

Terrestrial eyepiece.

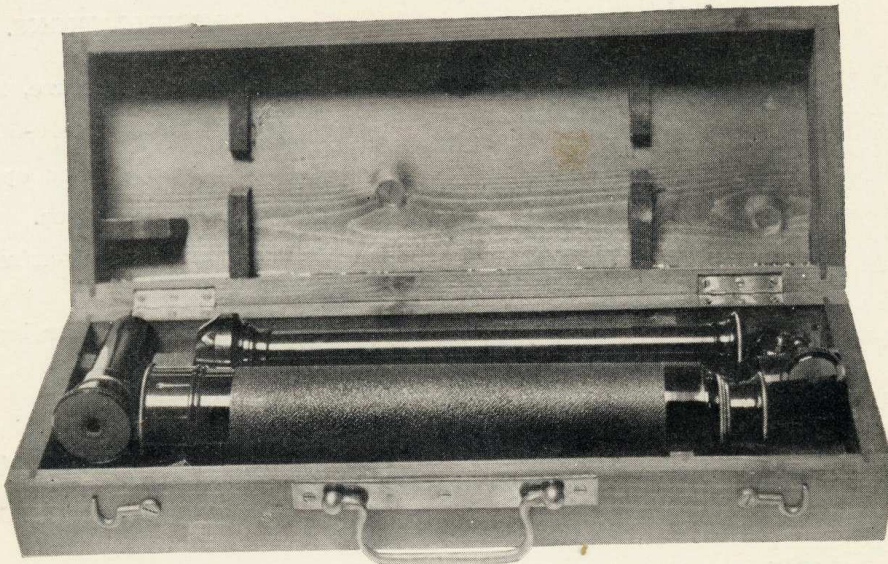
35 diameters.

Celestial eyepiece.

70 diameters.

No. 3312. Price.....\$20 00

Including handsome polished brass tripod and celestial eyepiece, put up in case complete as illustrated and described below.



3312

The telescope tripod and extra astronomical eyepiece for night observations put up in handsome wooden box complete, 14  $\frac{3}{4}$  inches long, 5  $\frac{1}{2}$  inches wide, 3 inches high.





**BARDOU**  
**ACHROMATIC TELESCOPE OBJECTIVES**

Made by Bardou & Son, Paris, France.

MOUNTED IN BRASS CELL.

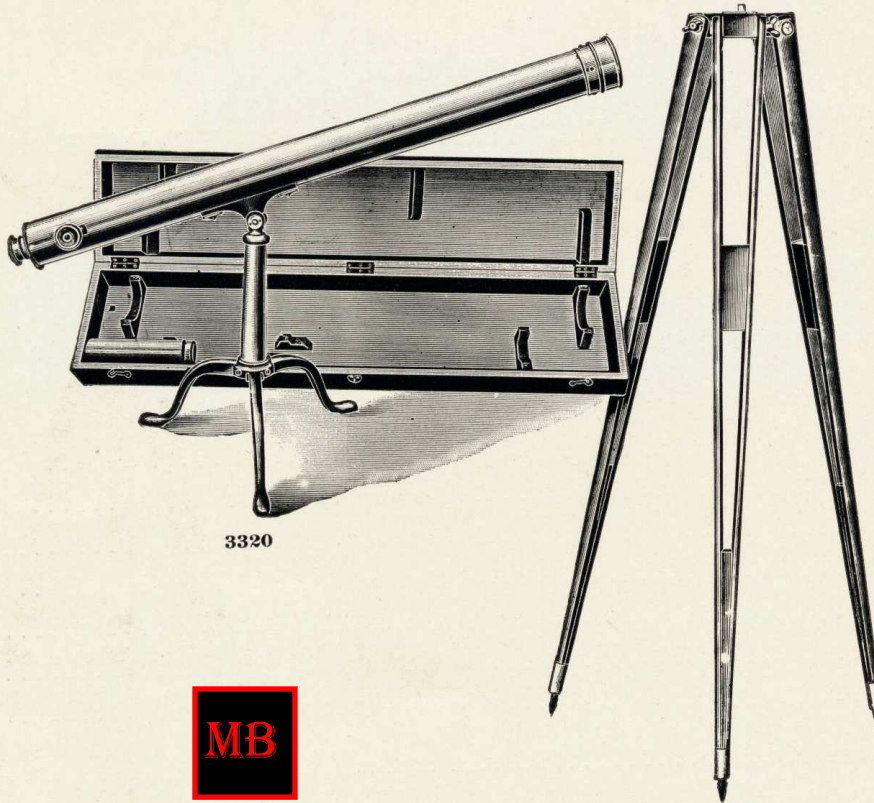
Size.	Focal length.	Price.
3 inches .....	42 inches .....	\$ 40 00
3 1/2 inches .....	50 inches .....	68 50
4 inches .....	56 inches .....	115 00
4 1/2 inches .....	63 inches .....	175 00
5 inches .....	70 inches .....	230 00
5 1/2 inches .....	80 inches .....	320 00
6 inches .....	90 inches .....	435 00
Diagonal Prism Eyepiece.....		20 00
Terrestrial Eyepiece.....		\$8 00 to 20 00
Astromical Eyepiece with sun glass.....		6 00 to 20 00

Diagonal Prism Eyepiece, Terrestrial Eyepiece and Astromical Eyepiece can be attached to any of the telescopes listed in this catalogue from 2-inch diameter objective lens and up.



**BARDOU OBSERVATION TELESCOPE**

Made by Bardou & Son, Paris, France.



Extra Stand for 3320

33 ligne or 3-inch Achromatic objective lens, polished brass body rack and pinion focusing adjustment, 2 eyepieces, 1 terrestrial magnifying, 55 diameters, 1 celestial magnifying, 110 diameters, fitted with sun glass. Length closed, 39 inches; length extended, 59 inches. Mounted on a fine lacquered brass table stand tripod and large polished oak tripod for out door observations.

No. 3320.	Price with extra tripod.....	\$80 00
No. 3320a.	Diagonal prism eyepiece, extra.....	20 00
No. 3320b.	Extra eyepieces.....	8 00





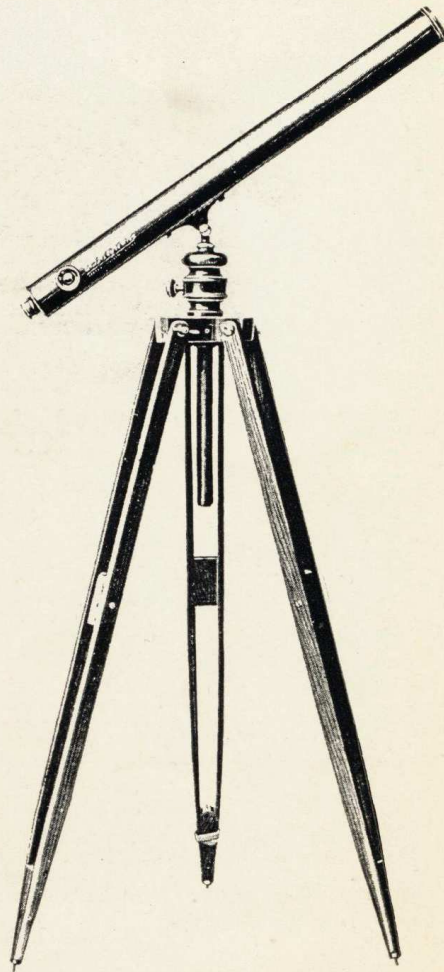
**BARDOU OBSERVATION  
TELESCOPE**

Made by Bardou & Son, Paris, France.

With Alt-Azimuth Mountings.

33 ligne or 3-inch Achromatic objective lens, polished brass body, rack and pinion focusing adjustment, 2 eyepieces, 1 terrestrial magnifying 55 diameters, one celestial magnifying 110 diameters, fitted with sun glass; length closed, 39 inches; length extended, 59 inches; on large oak tripod; oak box with handle.

- No. 3330. Price .....\$75 00
- No. 3330a. Diagonal prism eyepiece, price.. 20 00
- No. 3330b. Extra eyepiece..... 8 00



3330

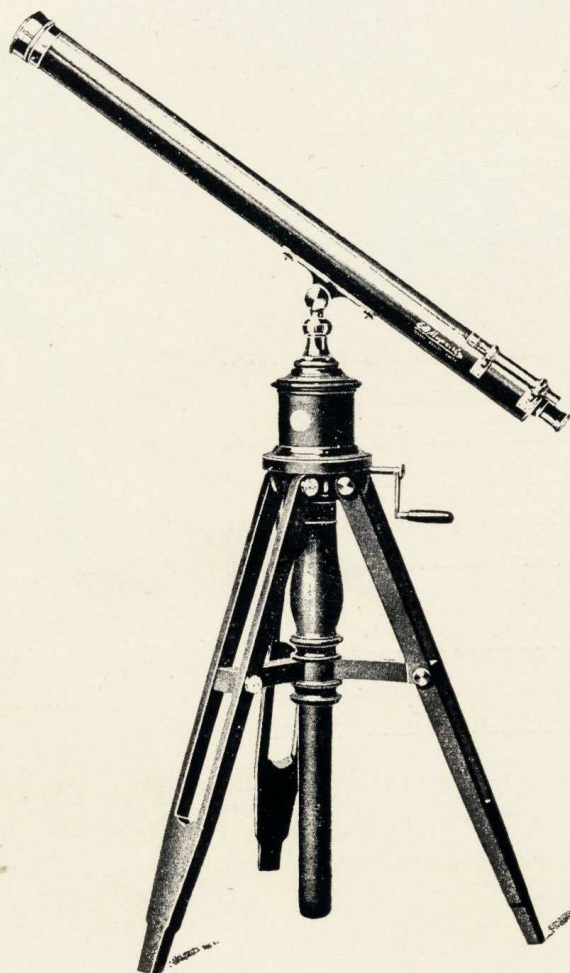




## **BARDOU OBSERVATION TELESCOPE**

Made by Bardou & Son, Paris, France.

On Extra Heavy Mahogany Mechanical Stand.



3400 to 3404

**SEE PAGE 13 FOR DESCRIPTION AND PRICE.**





**DESCRIPTION**

Achromatic observation telescope with alt-azimuth mounting on extra heavy mahogany mechanical stand.

Polished brass tube with finder.

Caps for objectives of telescope and finder.

Rack and pinion focusing adjustment.

Each telescope in strong oak box with handle, lock and key.

No. 3400. Bardou 3 ¼-inch objection lens; 4 eyepieces—Terrestrial powers 55 and 75 diameters, Celestial powers 90 and 160 diameters. 1 sun glass. Length: closed, 48 inches; extended, 68 inches. Finder has 1-inch objective lens.

Price .....\$235 00

No. 3401. Bardou 3 ½-inch objective lens; 4 eyepieces—Terrestrial powers 60 and 80 diameters, Celestial powers 100 and 175 diameters. I sun glass. Length: closed, 50 inches; extended, 70 inches. Finder has 1-inch objective lens.

Price .....\$280 00

No. 3402. Bardou 3 ¾-inch objective lens; 5 eyepieces—Terrestrial power 65 and 85 diameters, Celestial powers 85, 140 and 240 diameters. 1 sun glass. Length: closed, 53 inches; extended, 73 inches. Finder has 1 ¼-inch objective lens.

Price .....\$320 00

No. 3403. Bardou 4-inch objective lens; 5 eyepieces—Terrestrial powers, 70 and 90 diameters, Celestial powers, 90, 145 and 250 diameters. 1 sun glass. Length: closed, 56 inches; extended, 79 inches. Finder has 1 ¼-inch objective lens.

Price .....\$440 00

No. 3404. Bardou 5-inch objective lens; 5 eyepieces—Terrestrial powers, 90 and 120 diameters, Celestial powers 115, 180 and 300 diameters. 1 sun glass. Length: closed, 60 inches; extended, 82 inches. Finder has 1 ¼-inch objective lens.

Price .....\$725 00

Diagonal prism eyepiece..... 30 00

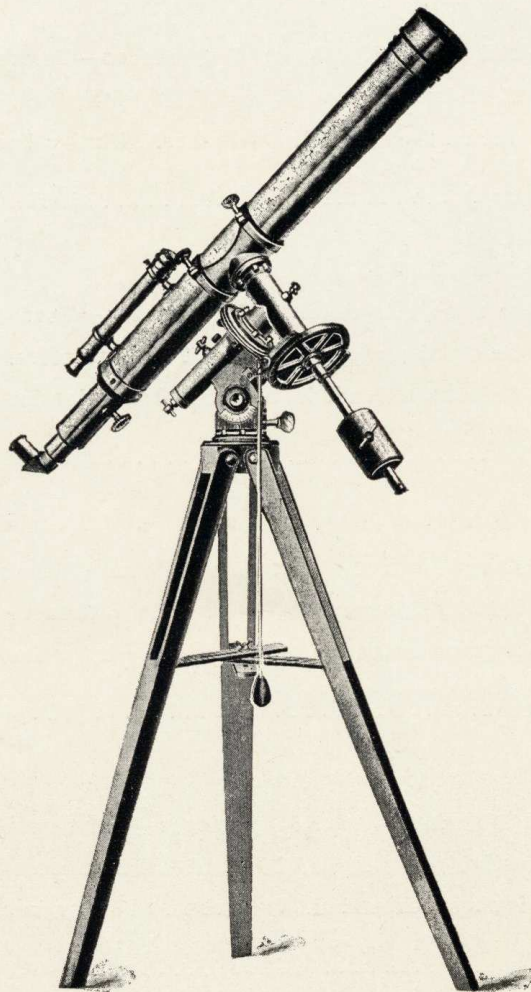
Extra eyepieces, each..... 10 00





**ASTRONOMICAL TELESCOPE**

Mounted on Equatorial Stand.



3500 to 3506

SEE PAGE 15 FOR DESCRIPTION.





DESCRIPTION

Achromatic astronomical telescope.

Polished brass tube with finder, on heavy oak tripod with equatorial mounting.

Mounting has finely divided circles in right ascension and declination, with show motion.

Diagonal prism eyepiece with each telescope.

No. 3500. 3-inch objective lens; 42 inches focal length; 3 celestial eyepieces, powers 50, 150 and 210 diameters.

Price .....\$235 00

No. 3501. 3 1/2-inch objective lens; 50 inches focal length; 3 celestial eyepieces, powers 65, 175 and 250 diameters.

Price. ....\$275 00

No. 3502. 4-inch objective lens; 56 inches local length; 4 celestial eyepieces, powers 75, 150, 225 and 280 diameters.

Price .....\$425 00

No. 3503. 4 1/2-inch objective lens; 63 inches focal length; 4 celestial eyepieces, powers 84, 175, 250 and 315 diameters.

Price .....\$500 00

No. 3504. 5-inch objective lens; 70 inches focal length; 5 celestial eyepieces, powers 84, 150, 200, 275 and 315 diameters.

Price .....\$675 00

No. 3505. 5 1/2-inch objective lens; 80 inches focal length; 5 celestial eyepieces, powers 93, 150, 200, 275 and 350 diameters.

Price .....\$800 00

No. 3506. 6-inch objective lens; 90 inches focal length; 5 celestial eyepieces, powers 120, 250, 315, 375 and 450 diameters.

Price .....\$1,000 00

Extra eyepiece.....\$7 50 to 12 00

Solar eyepiece..... 15 00

Filar micrometer..... 60 00

Position micrometer..... 80 00

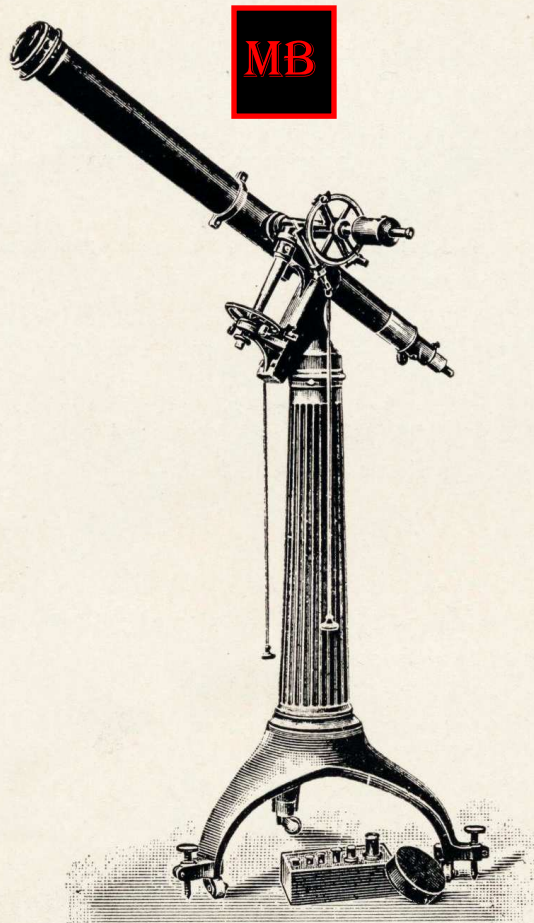


**STEINHEIL'S**

Made by Steinheil &amp; Sons, Munich, Germany.

**LARGE TELESCOPE ON FINE IRON STAND**

With Equatorial Mountings.



3600

**Telescope on Iron Stand, with Divided Circles  
and Slow Motion**

Telescope mounted on strong iron cradle with equatorial mountings, on iron stand with fluted column, the smaller instruments with brass tube axes, the large instruments with steel axes, each stand contains rollers and levelling screws. Motions by hand and slow motions, hour and declination circles divided on German silver and reading by magnifiers to 5" of Arc, 20" of time.

Telescope is fitted with finder balanced for all positions.

Pencil of rays 0.3 to 3.5 mm diameter.

**FOR PRICES, SEE PAGE 17.**





**DESCRIPTION**

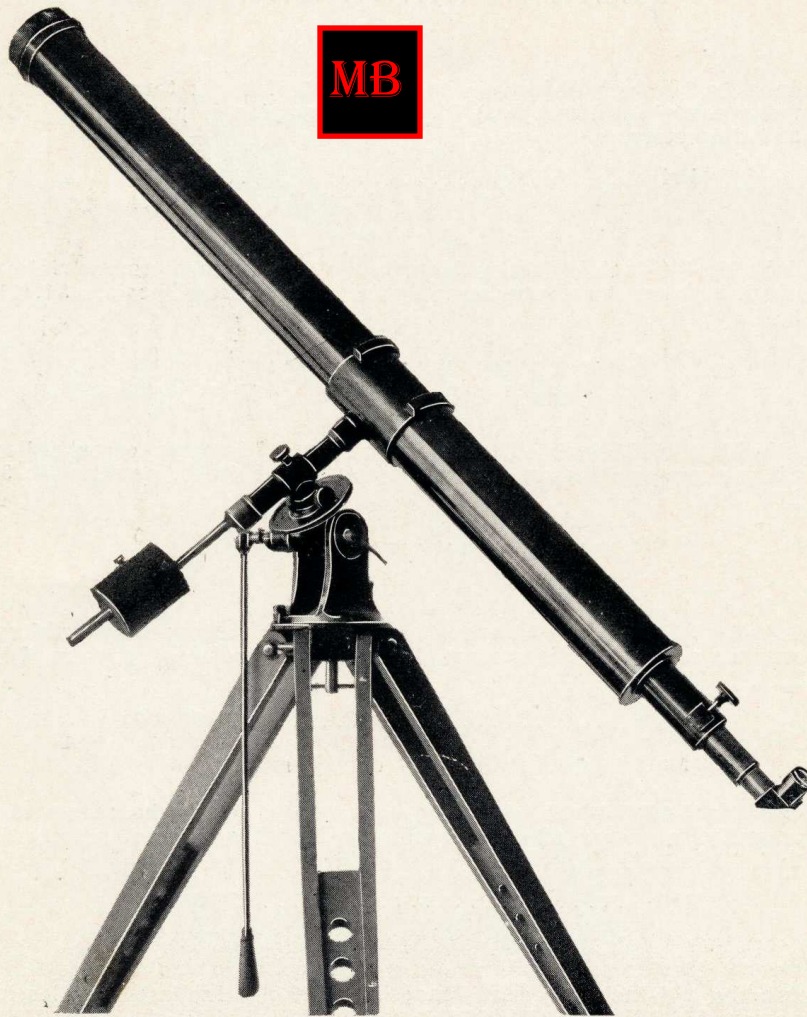
- No. 3601. Steinheil's 3 3/16-inch objective lens; focus 48 inches; terrestrial eyepiece magnifying power 46 diameters; 5 celestial eyepieces, powers 61, 87, 136, 174, 244 diameters.  
 Price .....\$625 00
- No. 3602. Steinheil's 3 3/4-inch objective lens; focus 55 inches; terrestrial eyepiece magnifying power 52 diameters; 5 celestial eyepieces, powers 71, 102, 158, 204, 284 diameters.  
 Price .....\$675 00
- No. 3603. Steinheil's 4 1/4-inch objective lens; focus 63 3/4 inches; terrestrial eyepiece magnifying power 60 diameters; 5 celestial eyepieces, powers 81, 116, 180, 232, 324.  
 Price .....\$800 00
- No. 3604. Steinheil's 4 13/16-inch objective lens; focus 72 inches; terrestrial eyepiece magnifying power 68 diameters; 6 celestial eyepieces, powers 68, 91, 170, 203, 260, 366.  
 Price .....\$890 00
- No. 3605. Steinheil's 5 5/16-inch objective lens; focus 80 inches; terrestrial eyepiece magnifying power 74 diameters; 6 celestial eyepieces, powers 74, 101, 145, 225, 290, 406.  
 Price .....\$1,000 00
- No. 3606. Steinheil's 5 13/16-inch objective lens; focus 87 inches; terrestrial eyepiece magnifying power 82 diameters; 6 celestial eyepieces, powers 82, 111, 158, 246, 316, 444.  
 Price .....\$1,100 00
- No. 3607. Steinheil's 6 3/8-inch objective lens; focus 95 3/4 inches; 7 celestial eyepieces, powers 59, 90, 121, 174, 270, 348, 486.  
 Price .....\$1,375 00
- No. 3608. Steinheil's 6 7/8-inch objective lens; focus 103 1/8 inches; 7 celestial eyepieces, powers 64, 96, 131, 187, 290, 375, 524.  
 Price .....\$1,700 00
- No. 3609. Steinheil's 7 7/8-inch objective lens; focus 118 1/16 inches; 8 celestial eyepieces, powers 55, 73, 111, 150, 215, 333, 430, 600.  
 Price .....\$1,800 00

Prices include Finder and Stand.



**ALOE'S OBSERVATION TELESCOPE**

With Universal Equatorial Mounting.

**No. 3700**

**Universal Equatorial Mounting.** This form of mounting can be used equally well for celestial and terrestrial observations. The mounting is made to swivel on the tripod head, in order to set the instrument in the meridian. The polar axis can be set at any latitude and a graduated arc gives the exact position. The instrument is set level by means of two small levels attached to the tripod top. The polar axis is fitted with worm wheel and worm for slow motion. The handle with the universal joint can be clamped on either side of the worm shaft.

No. 3700. 3-inch objective lens; 3 eyepieces, 50 to 150 diameters. Price.....\$235 00

No. 3700a. 4-inch objective lens; 3 eyepieces, 60 to 180 diameters. Price..... 350 00



**TRIPOD STANDS FOR TELESCOPES**



- No. 3802. **Hardwood Tripod Stand** with saddle support for telescope, adjustable to vertical and horizontal motion, and with contrivance to raise and lower the instrument.  
Price .....\$5 00
- No. 3804. **Hardwood Tripod Stand** of heavier construction. Stronger and more steady than preceding one. Vertical and horizontal adjustment, and with contrivance to raise and lower the instrument.  
Price .....\$7 50
- No. 3806. **Improved Hardwood Tripod Stand** with brass head and adjustable clamp to surround body and hold spy glasses varying in size up to those having objectives 2½ inches in diameter, giving horizontal and vertical motion. The advantage of a spy glass is increased fifty per cent. by the use of such a tripod stand.  
Price .....\$15 00
- No. 3808. **Superior Mahogany Tripod Stand** with polished cast iron head, universal brass joint and saddle, superior finish, and accurately ground to afford fine horizontal and vertical adjustments, also lever adjustment for raising and lowering the instrument. The best stand for a telescope not exceeding 3½ inches in diameter.  
Price .....\$24 00
- No. 3810. Same as above for telescopes exceeding 3½ inches in diameter.  
Price .....\$30 00
- No. 3812. **Superior Mahogany Stand** with equatorial mountings for telescopes not exceeding 4 inches in diameter. All wooden parts made of solid mahogany, with cast iron and bronze head, having circle for latitude, including magnetic compass, ranging in  
Price from.....\$60 00 to \$75 00



**FOLDING METAL TRIPOD**

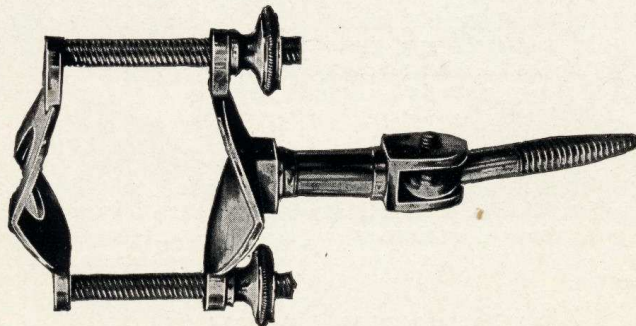


3815

With telescope-holder attached. Tripod and holder folded are 17 inches long and weighs 2½ lbs.; when extended for observation the tripod allows an elevation of 5 feet. Above illustration shows telescope secured in position on tripod.

Price, Tripod with holder.....\$7 50  
 Not including Telescope.

**CLAMP RESTS FOR TELESCOPES**



3818

Made of brass with collar and steel gimlet screw, for fastening to tree, post or window frames; avoid fatiguing arms during protracted observations, and just the thing for tourists and others not wishing a tripod stand.

14 Lignes	16 Lignes	19 Lignes	22 Lignes	25 Lignes	27 Lignes
\$1 25	\$2 00	\$3 00	\$3 50	\$4 00	\$4 50









## A FEW INSTRUCTIONS IN STAR FINDING FOR BEGINNERS

A conspicuous comet may come along but once or twice in a generation; the stars, however, are always in the sky—the stars and the moon. A telescope or strong prism binocular makes the moon almost a familiar country, so plainly does it show the chief “seas,” craters, and mountain ranges of our satellite. With the telescope we can see one of the moons of Saturn and four of the moons of Jupiter. If the telescope or prism binocular be used with our tripod attachment (as we advise) the revolutions of the satellites of Jupiter can be followed from night to night. They change their positions so rapidly as they revolve that their movements make a fascinating study. These few pages do not pretend to be an astromany, they merely afford a little friendly help at the beginning. Just as you can enjoy the flowers without being a botanist, so you can enjoy the stars without being a skilled astronomer.

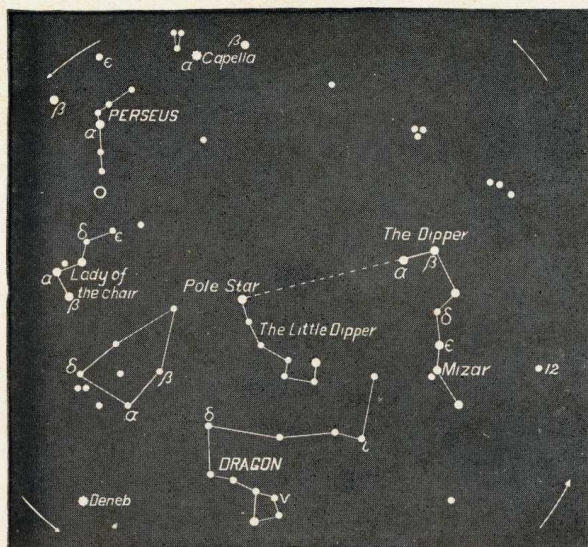
In addition to the things of the sky that come into “our neighborhood”—such as our moon, the planets and the comets—we shall want to look at some of those more distant objects which we call “the fixed stars.” They are almost inconceivably far away; so far that the distance between the earth and the sun or between the earth and its most distant fellow-planet, could serve only as a crude, imperfect yardstick. Light (which travels at a speed of 186,000 miles a second) takes but eight minutes to reach us from the sun; but it takes over four years to reach us from the nearest fixed star, and over eight years to reach us from the nearest of the important stars in our northern sky. The Pole star itself is at a light-distance of 47 years. In other words, the light from the Pole star which now falls upon the eye, started upon its journey 47 years ago!





## STARS OF THE NORTH

Visible at All Seasons of the Year.



Stars of the North. Map No. I

As the other stars always hold the same fixed place in reference to the Dipper, the Dipper—no matter what the time of year—can guide us to their positions. For example, whatever the position of the Dipper as it revolves about the pole, a line from the star marked ( $\beta$ ) to the star marked ( $\alpha$ ) will at all times point to the Pole star, close to the true North. Following this imaginary line still further across the sky, we shall thus always come near to the Lady of the Chair. This is a brilliant region of the Milky Way. The little circle between these stars and those of Perseus, just above, marks the position of two famous clusters. Your telescope will also show you that the region about the star Alpha ( $\alpha$ ) in Perseus is one of the most glorious in the sky. Among the easy double stars, find the little pair just below the star 12, on the right; the star Nu ( $\nu$ ) in the Dragon's head; and the star Delta ( $\delta$ ) at the corner of the house-shaped figure below the Lady of the Chair. Note also the little star near Mizar in the Dipper's handle. Its name is Alcor. The Arabs called the pair "the horse and his rider".

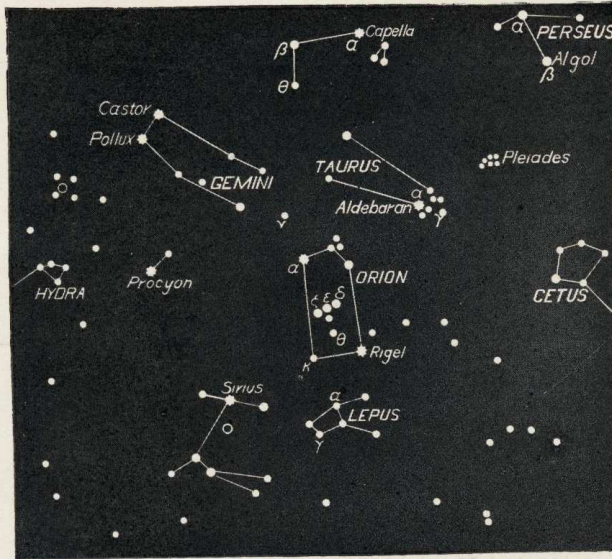
To find the above stars, face toward the North. They are always in the sky. Revolving, however, from right to left—as indicated by the arrows at the corners of map—the stars of the Dipper slowly change their position from hour to hour. But each night they reach their former position about four minutes earlier. For example, in January, at 9 P. M., you will find the Dipper low down, with bowl turned westward toward your left. In February, at the same time, it is a little higher up, as shown in above map; in May it is very high up, with bowl turned downward; in August, at 9 P. M., it is in the northwest, the bowl turned eastward and the handle pointed up. Watch it a night or two at different hours; you will find it easy to follow. The other stars, holding the same fixed place in reference to the Dipper, once each 24 hours revolve also about the pole.





## STARS OF WINTER

November, December, January, February.



Stars of Winter. Map No. II

Let us look first at the Pleiades, the most superb star-cluster in the sky. With the unaided eye some observers can see six stars, or seven—or eight. But with the telescope their number and brilliance are startling. Look next at the more scattered cluster near the red star, Aldebaran. Here you will find several pretty doubles. In the constellation Orion, which you can easily recognize in our map, you will find another beautiful field. Just below the star marked Epsilon ( $\epsilon$ ) and surrounding the star Theta ( $\theta$ ), you will find “the great Nebula of the heaven.” Here, too, is a beautiful region of double stars. Your telescope will also show you that below Orion, the star marked Gamma ( $\gamma$ ), in Lepus, is a double. Just to the left of this star, at the small circle shown below the bright star Sirius, your telescope will find something of delightful interest—a cluster of innumerable little suns. Late in May, when the above constellations will have moved over into the evening skies of the southwest, Halley’s Comet will be seen taking its course through the regions of Taurus and Gemini. Moving thence above the bright star Procyon, and thence through part of Hydra, it will probably pass from sight among the stars of Leo or Virgo;—see Map III.

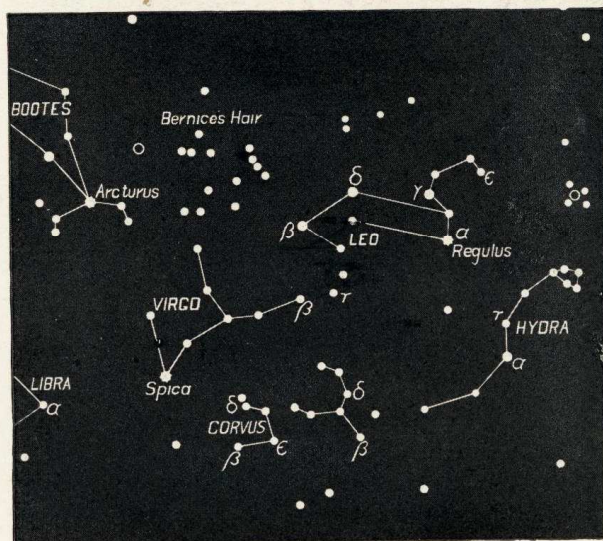
To find the above stars, *face South*. At 7 P. M. on January 1st, for example, you will see those at the left shining in the sky at the southeast, all above the horizon but Sirius—which will follow in half an hour. On January 1st as the night advances, you will find these stars mount higher in the sky, the stars of Orion reaching their highest point (due south) at about 11, and setting at the southwest at 5 A. M. And the stars rise a little earlier each night. Each night, therefore, after January 1st, you will find them somewhat further advanced at 7 o’clock. By 7 o’clock in March, you will therefore have to look for them, not at the southeast, but a little to the southwest. By actually watching them a night or two, you will see that there is no mystery about it. It is as simple as the rising and setting of the sun or moon.





## STARS OF SPRING

March, April, May, June.



Stars of Spring. Map No. III

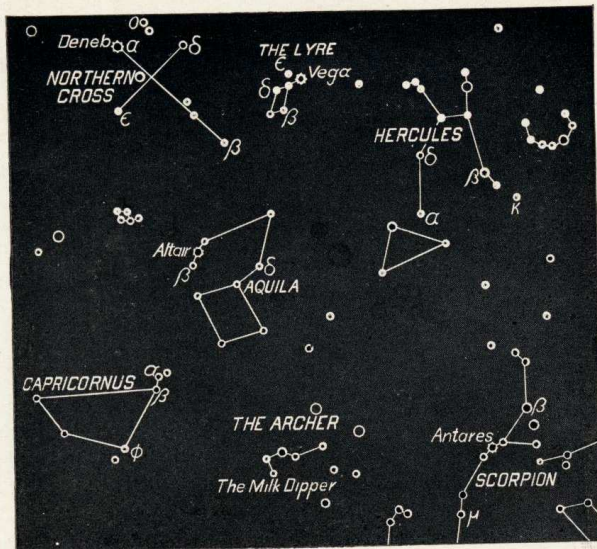
The conspicuous sign of the constellation Leo is the "sickle" formed by the bright star Regulus and the stars marked Gamma ( $\gamma$ ), Epsilon ( $\epsilon$ ), etc. You will find it indicated in the upper right-hand section of our little map. The sickle faces toward a little circle enclosed in a square of small stars. This marks the location of a bright cluster, hardly noticeable to the unaided eye, but sparkingly pretty in the telescope. On the other side of the sickle, you will see the group marked "Berenice's Hair." Here, too, the unassisted eye sees little of interest, but the telescope brings into charming view these strands and braids of twinkling light. Gamma ( $\gamma$ ) in Leo has a small neighbor-star near to it; and the star marked Tau ( $\tau$ ) which you will note lower down near Beta ( $\beta$ ) in Virgo is a "double." So also is the star Alpha ( $\alpha$ ) in Libra. Your Telescope will divide them both. During the greater part of 1911 the planet Jupiter will be in the region of Virgo. He is so brilliant you cannot mistake him. Four of his family of moons are clearly shown in the telescope. Sometimes one or more of them will pass behind the planet, only to re-emerge a few hours later; their changes are of ceaseless interest.

To find the above stars, face South. Looking southward on March 1st at 8 P. M., for example, you will find Regulus and the sickle rather high up, at the east and on your left hand. The stars of Virgo are now lower down, just rising. The stars of Orion, which we noted in our preceding map, have moved over to the southwest. As the night advances, or at the same hour on later nights, we will see these stars advance still further from east to west. For example, Regulus will seem almost directly overhead on March 1st at 11 P. M., or at 8 P. M. on the 1st of May. At a later hour this bright star will be found to the westward. As the other stars always hold the same fixed positions in relation to Regulus, you can easily judge as to their respective places. The white star Spica never gets so high in the heavens, and does not set quite so soon.



## STARS OF SUMMER AND AUTUMN

July, August, September, October.



Stars of Summer and Autumn. Map No. IV

Many things of interest are near the bright star Vega. As it rises in the northeast, let it get well up, and clear of the mists that always lie near the horizon before we begin our observations. The star marked Epsilon ( $\epsilon$ ) is an easy double, and in a large telescope we should see that each of its components is itself a double. The star at the foot of the Northern Cross, the one marked Beta ( $\beta$ ), bears the name Albireo. It is also a double. Though a little close for the unpractised eye, the telescope will separate the components nicely, if you will take care to get a sharp focus and to hold the glass steady. In Capricornus, further to the south, the stars Alpha ( $\alpha$ ) and Beta ( $\beta$ ) are both more easily divided. Sweep with the telescope through the beautiful fields of the Archer and the Scorpion. Here lies one of the richest regions of the Milky Way, which you will discover to be composed of vast stretches of innumerable suns. Looking toward the southwest, we shall find the planet Venus superbly bright during the early part of 1910. In the telescope you can then see her show the aspect of the crescent moon.

To find the stars shown in *lower* part of map, *face South*. At 8 P. M. on June 1st, for example, you will find the Scorpion just above the horizon at the extreme southeast. By August 1st, at 8 P. M. the Scorpion will be almost due south, and Capricornus will be at the southeast, just coming into view. The stars near Vega are in fine position for observation at the northeast in the early evenings of June and July, are high overhead in August, and are again well placed for us at the northwest from 8 to 10 during most of October and November. One of the richest sections of the Milky Way runs through the Northern Cross. With an hour or two of actual observation you will find it increasingly easy to identify the stars. A little personal interest and effort will bring a delightful reward.





## THE MOON

Our Nearest Neighbor.

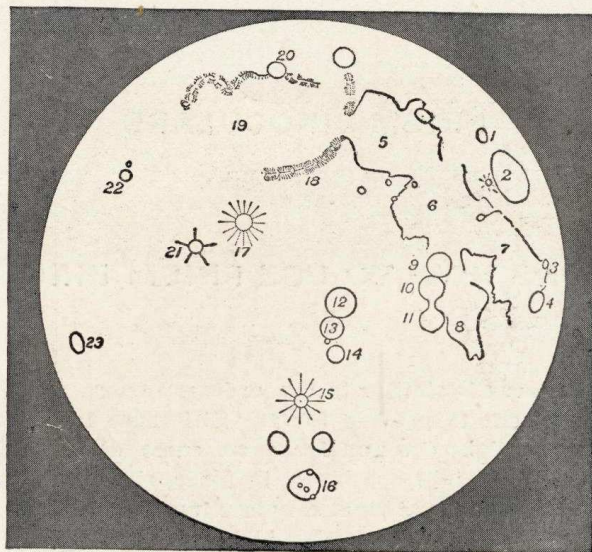


Chart of the Moon

The telescope will clearly show so many interesting lunar objects that we can here include only a small number. The nights of the brilliant full moon are not the best for observations. The full moon not only dims the light of the stars, but shows little of its own detail. It is in the early moon or the half-moon that we see the shadow-lines which bring the great mountains, craters, etc., into prominence. Begin with the early moon, following the objects on our chart, as they are numbered from left to right. If you are a beginner, take just a few at a time, make progress gradually, and you will not be bewildered or confused. Soon you will be delighted to find how easily you can learn the moon's geography. Learn first the dark plains called "seas." No. 2 is the "Sea of Crises" or "Sea of Conflicts;" No. 7 is the "Sea of Fecundity;" No. 8, the "Sea of Nectar;" No. 6, the "Sea of Tranquility;" No. 5, the "Sea of Serenity;" No. 19, the "Sea of Showers." The moon presents no evidence of life and practically no evidence of atmosphere—as we understand those terms; but its mysterious fascination has never been greater than to-day.

The above objects are not all seen to advantage at the same time. Beginning with the new moon they are best observed successively with the moon's gradual increase. No. 1 is Cleomedes, a walled plain 70 miles in diameter; 3 is Langrenus; 4 is Petavius, both crater-mountains; 9, 10, 11, are Theophilus, Cyrillus, and Catharina, huge craters, best seen in the moon 6 and 7 days old; 12, 13, 14, are Ptolemy, Alphonsus, and Arzachel. No. 15 is the most important crater, Tycho, from which—in full moon—note the lines of radiation; 16 is Clavius; 17 is the superb crater-mountain called Copernicus—note radiations; 18 is a mountain-range, the Apennines; 20 is Plato; 21, Kepler; 22, Aristarchus, brightest spot; 23 is the crater Grimaldi, the darkest spot. The lunar "Seas" are named on the preceding page. Most of the published photographs and charts of the moon are "upside-down," as viewed in an astronomical telescope.



MB

## PRISM BINOCULARS

-AND-

### DIRECTIONS HOW TO USE PRISM BINOCULARS

The **Adjustment for Focus** is similar to the ordinary opera glass. The right eyepiece also has a separate adjustment to provide for any difference in the observer's eyes. The simplest plan is to close the right eye and focus on some distant, sharply-defined object using the left eye only. If the right eye is not in focus, the eyes are of unequal strength. This can be corrected by adjusting the right eyepiece until the vision is the same as the left. For normal eyes the right eyepiece should be set at zero.

The **Adjustment for Eye-Distance** is made by simply bending the hinged cross-bars while looking at the sky or some distant object. When correctly found, the two fields will blend into one, with a round, clearly defined margin. If incorrectly adjusted, the field will be seen in two separate rings. The washer on the upper bar above the hinge is engraved to indicate the pupillary distance in millimeters.

The cleaning of the lenses is best done with a silk handkerchief or a soft clean chamois, without unscrewing the glass or disturbing its optical adjustment.

When the glass has been properly set for Focus and Eye-Distance it may be left in this position without changing the adjustment in any particular, as the case holds the glass in any position.

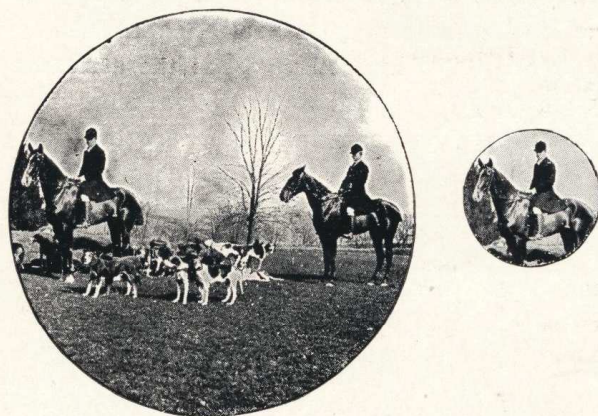
The optical qualities of the Binocular glasses are so superior that we advise the purchase and use of the lower powers, except where high magnification is absolutely necessary. A comparatively low power will be found adequate for all ordinary purposes, and the larger illumination and greater steadiness of the image in the field of view, will increase the pleasure and satisfaction of the purchaser.



## PRISM BINOCULAR FIELD GLASSES

In presenting this catalogue, we bring to your attention the wonderful improvements which recent years have worked in field glasses by the addition of the Binocular Field Glasses and by the introduction of the novel optical principles upon which they are based. The field glass was then converted from a heavy, unwieldy instrument into a binocular of such concentrated power that it becomes at once an appreciated companion in peace and a necessity in war.

All of the objectionable features present in the older type of glasses have been eliminated in our present instruments. To secure compact construction and great power, Porro prisms and astronomical eyepieces are called into service, resulting in an 8-power glass measuring but 4 inches in length. The Porro prisms cause the rays to be bent upon themselves in such a way as to greatly shorten the glass and at the same time the inverted image given by the objective is reinverted and seen in its natural position. To secure lightness in weight, aluminum, carefully ribbed for strength, is used for the body, which is handsomely and durably finished.



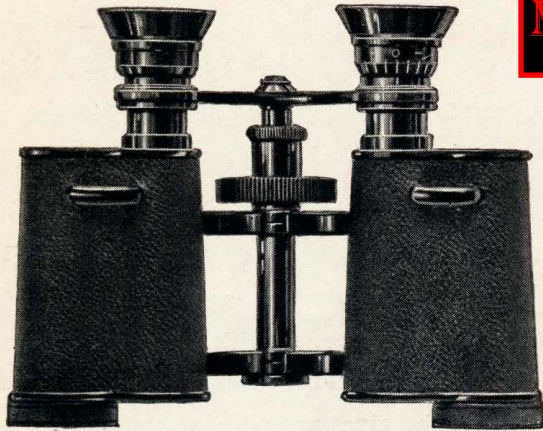
**Comparative field of view of the Stereo Binocular  
and the ordinary field glass.**

The old type of glasses was made for the normal eye only; the prism binocular glass can be quickly and accurately adjusted for any individual eye. This is accomplished in two ways. The proper distance between the eyes (the pupillary distance) is obtained by simply turning the halves of the glass upon the center hinge and when once found, the hinge can be set, so that in the future the binocular can be quickly opened to the exact pupillary distance. It is highly important to have the pupillary distance correctly adjusted in order to obtain the clearest and brightest field; the two fields shown by the two objectives will then coincide perfectly and permit long observations without fatigue. Should the focus of the eyes be unequal, the adjustable eyepiece is set to compensate for the difference.



**BAUSCH & LOMB-ZEISS STEREO  
BINOCULAR**

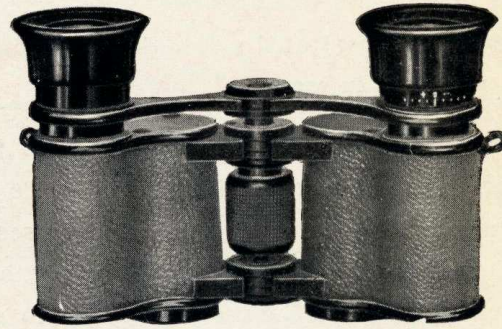
8X



3900

**THE BUSCH PRISM  
OPERA GLASS**

**THALIAR MODEL.**



4000 Three-Power

No. 3900. Bausch & Lomb-Zeiss Stero Field Glass 8x with focusing attachment. This is the most popular production in this line, for, in size, power and general excellence, it offers attractions which are not duplicated. It is of very small size, while its magnification of eight diameters is sufficient to view even very distant objects with perfect satisfaction. For example, one enthusiastic owner states his ability, when the atmosphere is clear, to distinguish the individual cars in a train twelve miles away. The tourist, the sportsman, the military man unite in approving this compact Stereo. For yachting, touring, hunting or scientific observation it is strongly recommended. Its definition is so perfect that it has become the inseparable companion of the geologist and engineer.

Price—Provided with the needed accessories in a handsome sole leather case.....\$50 00

**SPECIFICATIONS.**

No. 4000. Busch Thaliar, Three-Power.....Price, \$40 00

Magnification, 3 diam.; object glass, 1/2 in.; field of view at 50 feet, 12 feet; height, 2 1/4 in.; weight, 7 oz.

Mounted in aluminum with japanned finish. Covered with black morocco and in a leather case. Adjustable for pupillary distance and furnished with turning eyepiece for unequal strength of eyes and universal focusing attachment.

The general recognition of the superiority of the prism binocular to field glasses of the older type has led to the demand for a glass, similar in quality and construction, but of smaller power and weight, for use at the opera or the theatre. The Thaliar model of the Busch Prism Opera-glass is a happy and effective response to this demand. Light in weight, small in size, attractive in finish, and affording both a wide view and brilliant illumination, it combines all the qualities—mechanical and optical—that must necessarily enter into a popular glass of the highest type. The use of so perfect a little instrument adds greatly to the pleasure of an operatic or theatrical performance.





**BINOCULAR FIELD GLASSES.**

**ALOE STANDARD**



4012

The Aloe Standard No. 4010 has sufficient magnifying power (6 diameters) for general use in hunting, racing, games, yachting, ocean travel or the every-day use of the tourist on the mountains or at the seashore. Having a large field and affording greater steadiness than the higher powers, it is preferred for universal service and is especially recommended for regions where hazy, foggy and rainy weather is frequent.

**SPECIFICATIONS.**

- No. 4012 Aloe Standard, Six-Power.....Price, \$40 00  
Magnification, 6 diam.; object glass,  $\frac{3}{4}$  in.; field of view at 1000 yards, 125 yards; height,  $3\frac{3}{4}$  in.; weight, 14 oz.; Bodies covered with black morocco and in black case.
- No. 4014. Aloe Standard, Nine-Power.....Price, \$40 00  
Magnification, 9 diam.; object glass,  $\frac{3}{4}$  in.; field of view at 1000 yards, 80 yards; height,  $4\frac{1}{4}$  in.; weight, 16 oz; bodies covered with black morocco and in black case.
- No. 4016. Aloe Standard, Twelve-Power.....Price, \$40 00  
Magnification, 12 diam.; object glass,  $\frac{3}{4}$  in.; field of view at 1000 yards, 60 yards; height,  $4\frac{1}{4}$  in.; weight, 16 oz; bodies covered with black morocco and in black case.

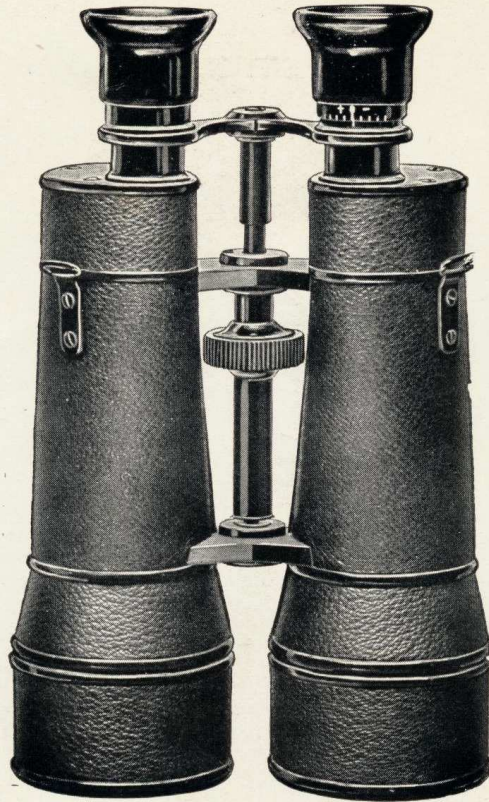
The above binoculars are mounted in aluminum with japanned finish. Adjustable for pupillary distance and furnished with turning eyepiece for unequal strength of eyes and universal focusing attachment.





## THE BUSCH TEN-POWER TERLUX PRISM BINOCULARS

The U. S. Army and Navy Model.



4018 Ten-Power

In binoculars of every type the size and weight of the instrument have presented important considerations. The tourist, the yachtsman and the hunter have naturally insisted upon a glass as small in size and as light in weight as would serve their specific purposes. In the Terlux, however, it has been thought advisable to provide at least one type of prism binocular in which these limitations should be disregarded.

The manufacturers—acting under specifications suggested by the U. S. Navy and Army—have sought to provide a glass in which the considerations of weight and size should be subordinated to the production of an instrument affording the broadest field and the largest possible illumination consistent with a given power. Taking a magnification of 10 diameters for the average model, the manufacturer has here placed at the command of the purchaser a glass which in its breadth of field, in the sharp, even clearness of its definition, and in the brilliant light-gathering power of its lenses, is altogether unrivalled in the European or American market. Under the most exacting tests, it has not only held its own—despite its larger weight and size—but has steadily advanced in favor, both with the general public and with the officers of the army and navy. Because of the large diameter of its object lenses—possessing a clear aperture of  $1\frac{3}{4}$  inches—it is of special value for marine use, for use at night, or for use under any of the adverse conditions of light and weather.

### SPECIFICATIONS.

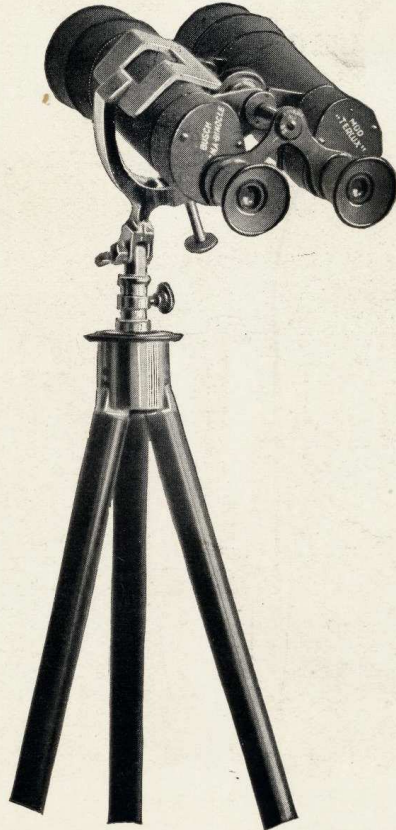
- No. 4018. Busch Terlux, Ten-Power.....Price, \$75 00  
Magnification, 10 diam.; object glass,  $1\frac{3}{4}$  in.; field of view at 1000 yards, 80 yards; height,  $7\frac{3}{4}$  in.; weight, 29 oz.; bodies and sun-shades covered with black morocco and in black case.
- No. 4020. Same as No. 4018, with shifting amber ray-filters within eye-piece caps.....Price, \$79 00
- No. 4022. Same as No. 4018, with shifting amber ray-filters within eye-piece caps and clamp for pupillary adjustment; tan bodies and tan case, as furnished to U. S. Navy.....Price, \$85 00

**SPECIAL NOTE.**—The Busch Ten-Power Terlux has proven of special service to the amateur astronomer, the student of bird-life, and the followers of "Nature study" in every branch. For astronomical use a tripod with adjustable clamp.





# THE HIGH-POWER BUSCH TERLUX PRISM BINOCULARS



4030

**Terlux on Tripod with Adjustable Clamp.**

Seeing with two eyes (binocular vision) is attended with so much greater comfort and pleasure than the attempt to see with one eye (monocular vision), that the well-known Terlux model in its high powers is frequently used as a substitute for the "spy-glass" and the small telescope. A demand has thus arisen for the 15-power and the 18-power Terlux.

In any glass, an increase of magnification always increases the necessity for holding the glass steady, and the greater weight and size of binoculars of great power naturally add to the difficulties of sustained and steady vision. But in cases where these objections are not insuperable, and especially under conditions in which it is possible to use our simple tripod attachment, the high-power Terlux presents advantages that are not to be overlooked. In observing signals, in noting the brands of cattle, in the work of the rifle range, in picking out the names of steamers, or in following the far distant manoeuvres of naval or military forces, these glasses possess unique efficiency. They have all the power of telescopes of similar magnification, combined with a larger field of view, more brilliant illumination and surpassing sharpness and clearness of definition. Letters of 3½ inches height can be seen, by an observer with normal eye-sight, at a distance of over 3,500 feet. Because of their great power, in conjunction with the exceptional size and brilliance of the field of view which they afford, their use in the observation of the moon, the double-stars, and other interesting phenomena of the sky has given especial pleasure and satisfaction to the amateur astronomer.

### SPECIFICATIONS.

No. 4030. Busch Terlux, Fifteen-Power.....Price, \$85 00

Magnification, 15 diam.; object glass, 1¼ in.; field of view at 1000 yards, 50 yards; height, 8½ in.; weight, 32 oz.

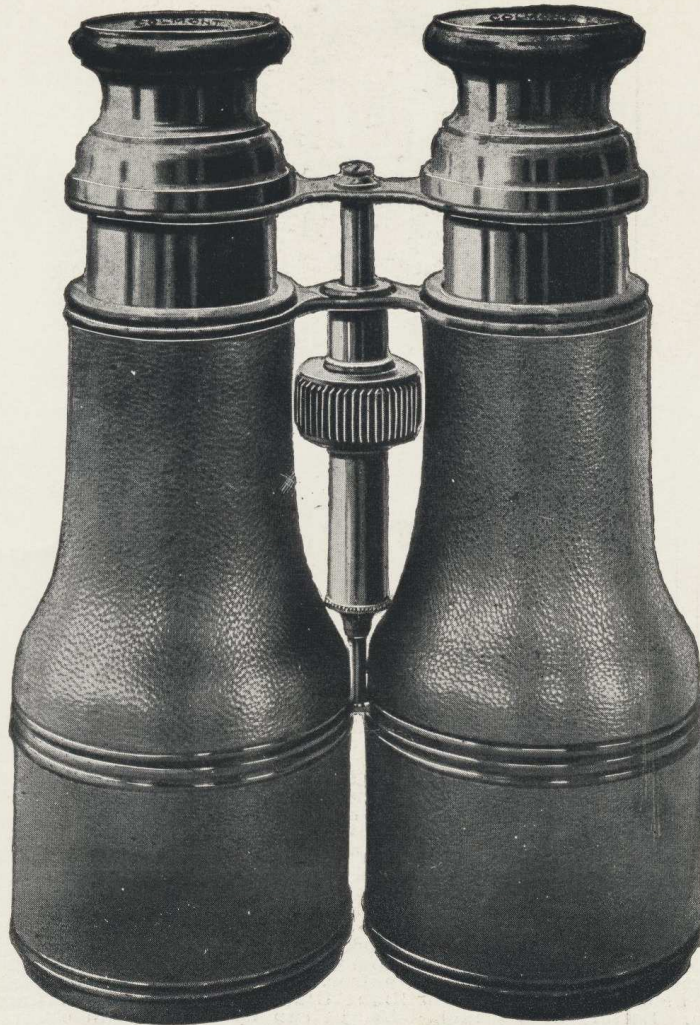
No. 4032. Busch Terlux, Eighteen-Power.....Price, \$90 00

Magnification, 18 diam.; object glass, 1¼ in.; field of view at 1000 yards, 40 yards; height, 10¼ in.; weight, 36 oz.

An adjustable clamp with vertical and horizontal movement is supplied for Busch "TERLUX" binoculars, holding them securely and steadily for prolonged observation. While this clamp fits on any ordinary camera tripod, the tripod here described is made especially high for this purpose.

Tripod, of collapsible metal tubes, length open 50 inches, closed 17 inches..Price, \$7 50

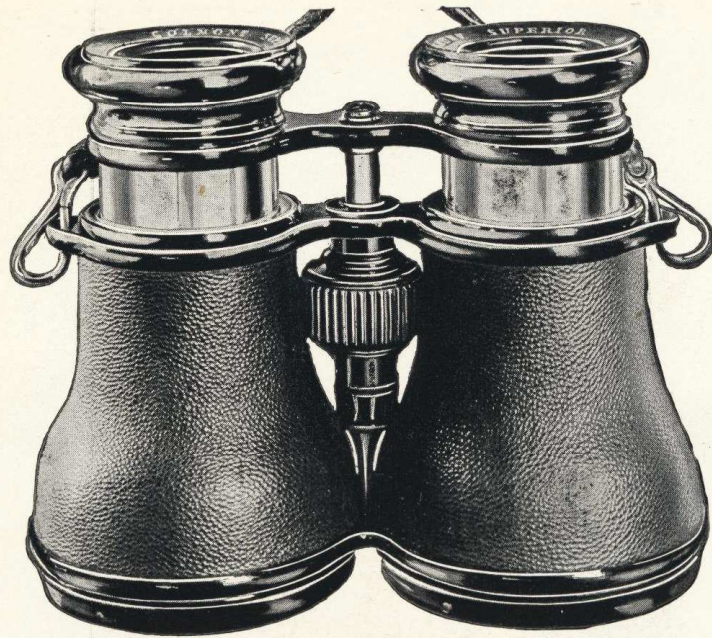


**COLMONT FIELD GLASS**

5000

No. 5000. The name Colmont is in itself a guarantee of quality, and we can recommend this field glass to anyone desiring a strictly high class glass for very little money, very largely used by hunters and the study of birds. The bodies are covered with black morocco leather and the trimmings japanned finished. Put up in handsome case with shoulder straps.....Price, \$12 00





5010



5012

No. 5010. Special tourist glass for travelers: or mountain climbers, people who cannot be incumbered with a heavy clumsy field glass, and yet who want strong and clear lenses, a fine glass for camp, motor boat and automobile, for hunting, races, yachting and tourist in the mountains. Can be slipped in the pocket or can be carried slung over the shoulder by means of a cord which snaps on side of glass. Black morocco leather and sole leather case. .Price, \$18 00

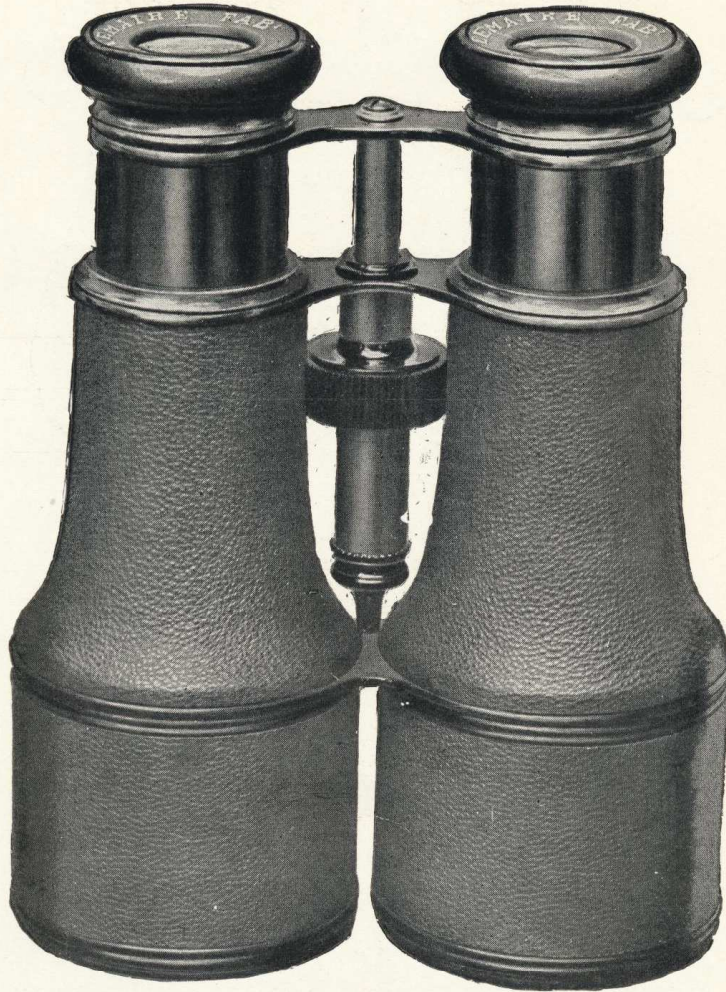
No. 5012. Same as No. 5010. Tan calf aluminum and tan sole leather case. .Price, \$23 50





## LEMAIRE ENGLISH ARMY FIELD GLASS

Made by Lemaire, Paris, France.



5020

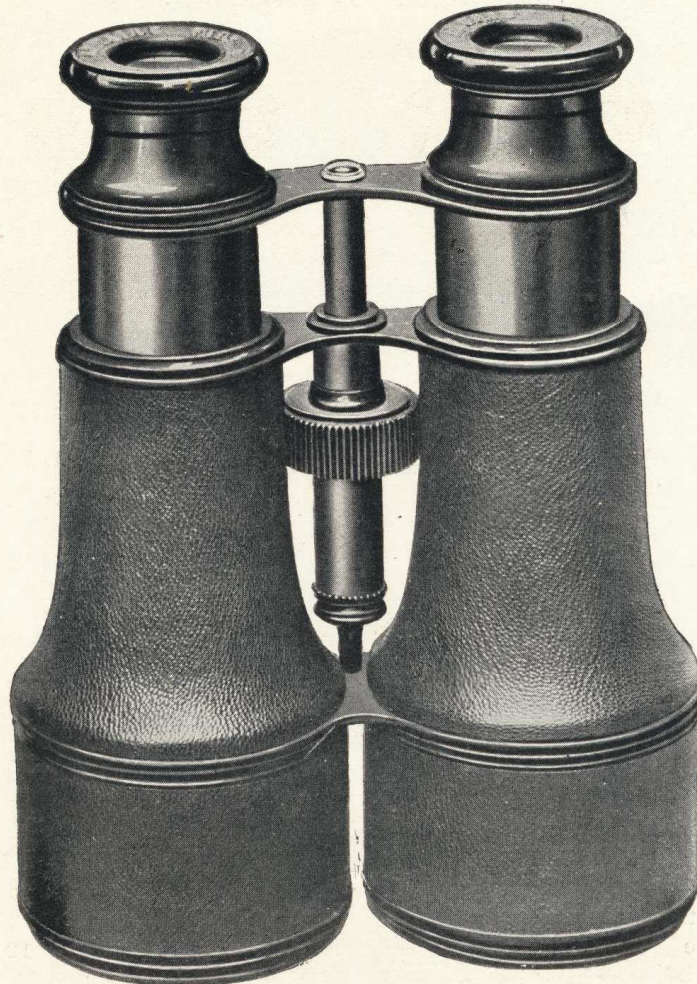
The Lemaire English Army Field Glass is one of the most powerful glasses of this construction, and will be welcomed by persons who use a field glass frequently on account of its portability and power, the body being short and compact, the eye pieces extra large, admitting of more light, having a large field and exceedingly high power. **This glass especially meets the requirements of the cattle men.** Even the brands of cattle can be discerned from one to two miles, according to atmospheric conditions. Furnished complete in stitched sole leather water-proof case with shoulder strap.

		Lignes, 21	24	26
No. 5020.	Six lenses.....	\$18 00	\$20 00	\$22 00
No. 5021.	With 12 lenses.....	22 00	25 00	27 50
No. 5022.	Same as No. 5020, with branches to bend.....		24 00	28 00
No. 5023.	Same as No. 5021, with branches to bend.....		28 00	33 00
No. 5024.	Same as No. 5020, aluminum, very light.....		35 00	40 00
No. 5025.	Same as No. 5021, aluminum, very light.....		38 00	44 00
No. 5026.	Same as No. 5022, aluminum, very light.....		44 00	48 00
No. 5027.	Same as No. 5023, aluminum, very light.....		48 00	54 00



**LEMAIRE  
UNITED STATES SIGNAL SERVICE FIELD GLASS**

Made by Lemaire, Paris, France.



5030

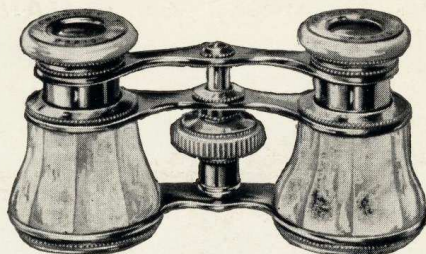
**Lemaire United States Signal Service Field Glass.** Made especially for those desiring a powerful and substantial glass. Highly endorsed by government Pilots and River Men. Oxidized metal mounting, fine leather body, six special high power lenses, with heavy stitched waterproof sole leather case and strap.

	Lignes, 21	24	26
No. 5030. ....	\$16 00	\$18 00	\$20 00
No. 5031. Same as No. 5030, with twelve lenses .....		22 50	25 00
No. 5032. Same as No. 5030, with branches to bend. The advantage of this style over others is that by means of its construction the centers of the lenses can be made to concede exactly with the centers of the eye; the result is that the position and tension of the muscles are normal, and there is no strain on them, as when the ordinary glass is used, and can be used any length of time without the slightest pain or fatigue to the eyes, and are therefore the best form to use.			
	24 Lignes.....	\$22 50	
	26 Lignes.....	25 00	
	Lignes, 24	26	
No. 5033. Same as No. 5031, with branches to bend.....	\$27 50	\$30 00	
No. 5034. Same as No. 5030, mounting of aluminum .....	38 00	40 00	
No. 5035. Same as No. 5031, mounting of aluminum .....	42 50	45 00	
No. 5036. Same as No. 5032, mounting of aluminum .....	45 00	50 00	
No. 5037. Same as No. 5033, mounting of aluminum .....	55 00	55 00	



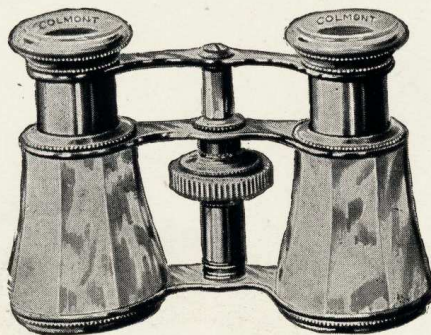


**OPERA GLASSES**



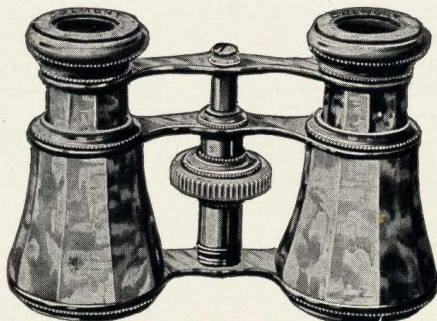
5100

	Pearl.	Trimmings.	Lignes,	12		15
No. 5100.	White	Gilt Low shape		\$12 75		\$14 00
No. 5101.	Oriental	" "		12 75		14 00



5106

	Pearl.	Trimmings.	Lignes,	12	14	15
No. 5106.	White	Gilt		\$11 50	\$12 25	\$13 50
No. 5107.	Oriental	"		11 50	12 25	13 50
No. 5108.	Smoke	"		.....	12 25	.....



5110

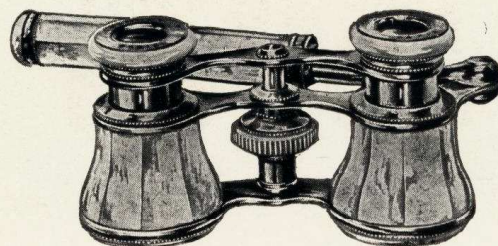
	Pearl.	Trimmings.	Lignes.	Each
5110.	White	Gilt Pearl Tubes	14	\$15 00
5111.	Oriental	" "	14	15 00

Carefully selected pearl with the best high power achromatic lenses. Each glass put up in a handsome case.



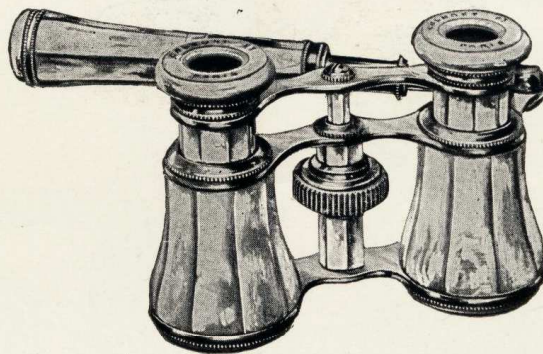


**OPERA GLASSES WITH HANDLE**



5200

	Pearl	Trimmings	Handle	Lignes	Each
No. 5200.	White	Gilt	Pearl	14	\$18 50
No. 5201.	Oriental	"	"	"	18 50
No. 5202.	Smoke	"	"	"	18 50
No. 5203.	White	Aluminum	"	"	21 50
No. 5204.	Oriental	"	"	"	21 50



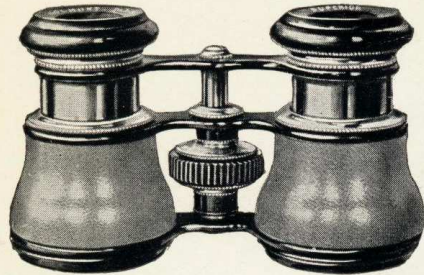
5210

	Pearl	Trimmings	Handle	Lignes	Each
No. 5210.	White	Gilt	Pear-shaped	14	\$19 25
No. 5211.	Oriental	"	"	"	19 25
No. 5212.	Smoke	"	"	"	19 25
No. 5213.	All White	Aluminum cross-bars	"	"	28 00

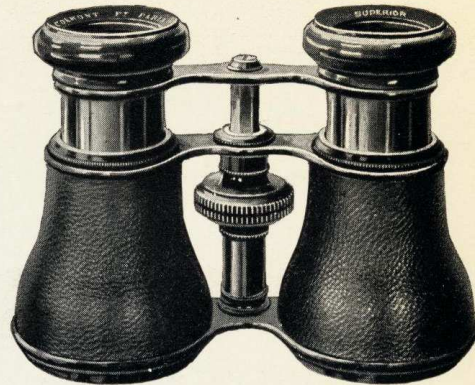
This is the "Bride's Glass."

Very handsome selected pearl opera glasses, complete with handle attached to the glass, the very finest high power achromatic lenses.



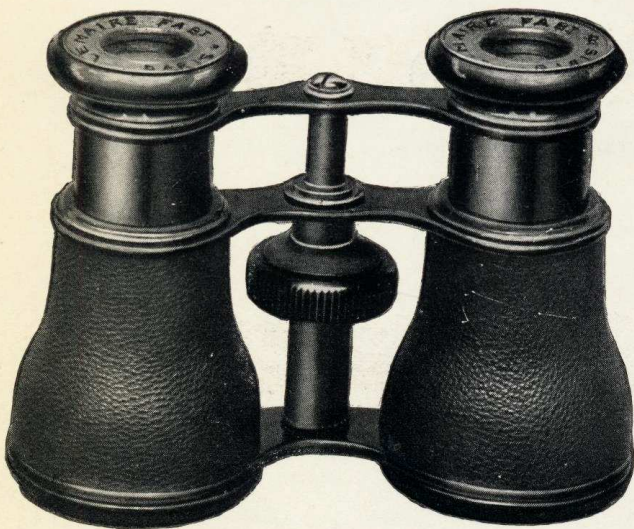


5225 Low Form

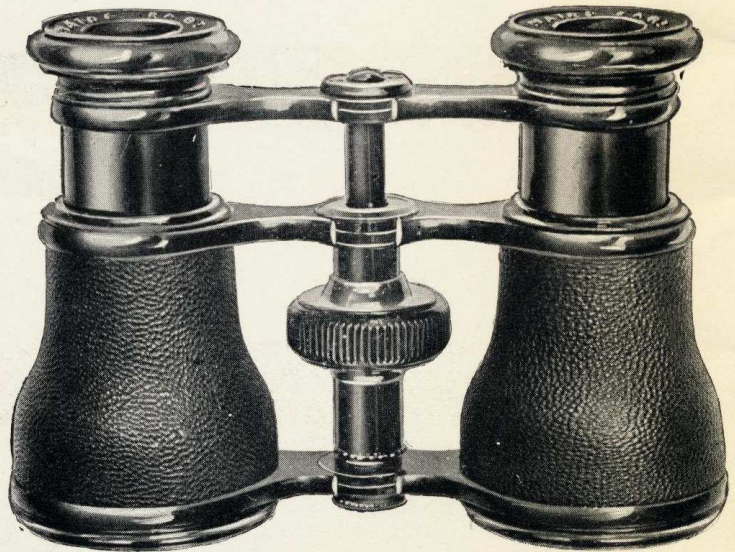


5225 High Form

		12 Lignes.	15 Lignes.
No. 5220.	Black Morocco japanned mountings.....	\$6 50	\$7 00
No. 5221.	Maroon Levant, japanned mountings, with gilt trimmings .....	8 00	8 50
		15 Lignes.	17 Lignes.
No. 5225.	Black Morocco, japanned, oxidized rings, large eyes	\$7 50	\$8 50
No. 5226.	Black Morocco, aluminum, japanned, polished tubes.	9 50	10 50



5230



5232

		13 Lignes.	15 Lignes.	19 Lignes.
No. 5230.	The celebrated Lemaire Opera Glass, black Morocco, polished japanned trimmings...	\$8 00	\$10 00	\$15 00
No. 5232.	The celebrated Lemaire Opera Glass, with adjustable bars for extra wide or narrow face, so the lenses can exactly fit the center of the eyes, black Morocco, polished, japanned trimmings.....	13 50	15 00	19 50

Put up in handsome Morocco cases.



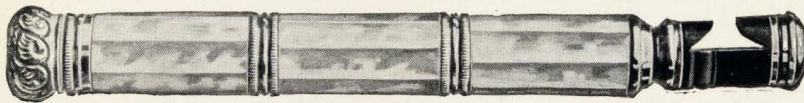


OPERA GLASS HOLDERS

Will Fit Any Opera Glass.

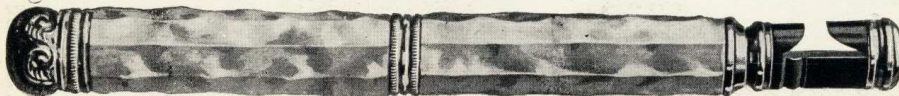


No. 5250. Black celluloid body, gold filled tube and trimmings.....\$2 50



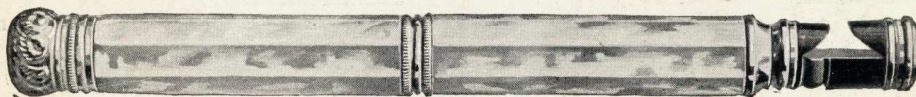
No. 5251. White pearl body, gold filled tube and trimmings.....\$6 00

No. 5252. Oriental pearl body, gold filled tube and trimmings..... 6 00



No. 5253. Plain white rustic pearl body, gold filled tube and trimmings.....\$6 00

No. 5254. Plain oriental pearl body, gold filled tube and trimmings..... 6 00



No. 5255. Rustic white pearl body, gold filled tube and trimmings.....\$7 00

No. 5256. Rustic oriental pearl body, gold filled tube and trimmings..... 7 00



No. 5257. Oriental pearl, roll plated mountings, pearl tubes.....\$8 00

No. 5258. White pearl, roll plated mountings, pearl tubes..... 8 00

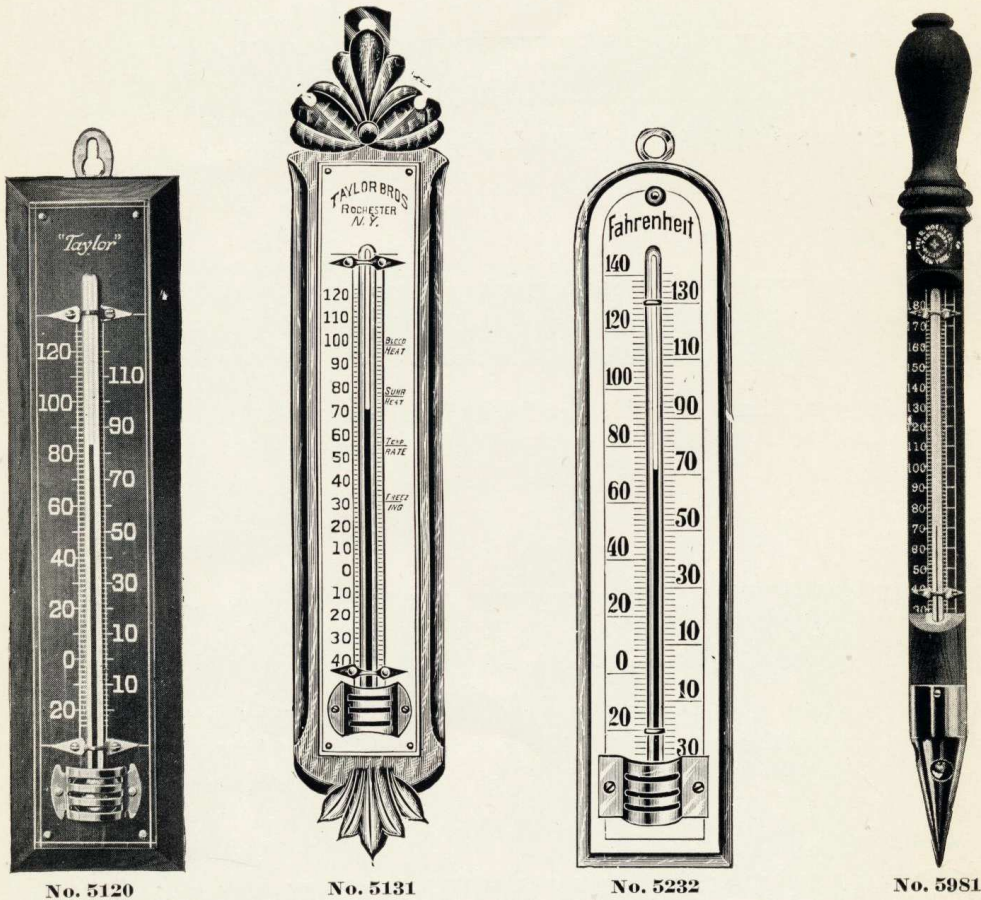
No. 5259. Smoke pearl, roll plated mountings, pearl tubes..... 8 00





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Manufacturers and Importers of all Kinds of Thermometers



No. 5120. A high grade Thermometer, for in or out of doors, black oxidized face, with white filled figures and graduations; range, 20° below zero to 120° above zero.

Price, each, 8 in. long...\$1.50; 10 in. long...\$2.00

No. 5131. 8-inch fancy carved back Thermometer, in Flemish oak; black oxidized face, with white filled figures and graduations; a beautiful Thermometer for the hall or parlor.

Price, each..... \$2.50

No. 5232. A high grade porcelain face bevel edge Scale, enameled black figures, oak back, polished all sides.

Price, each, 8 in. long...\$2.50; 10 in. long...\$3.00

No. 5981. Hot bed Thermometer, magnifying mercury tube, made to shove into the ground.

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