BAUSCH & LOMB

STEREO BINOCULARS

Bausch & Lomb

Stereo Binoculars

Bausch & Lomb Optical Co.

ROCHESTER, N. Y.

NEW YORK, 200 Fifth Avenue
WASHINGTON, 613 15th St., N.W.
LONDON, ENGLAND

CHICAGO, 122 S. Michigan Boulevard
SAN FRANCISCO, 154 Sutter St.
FRANKFURT, GERMANY

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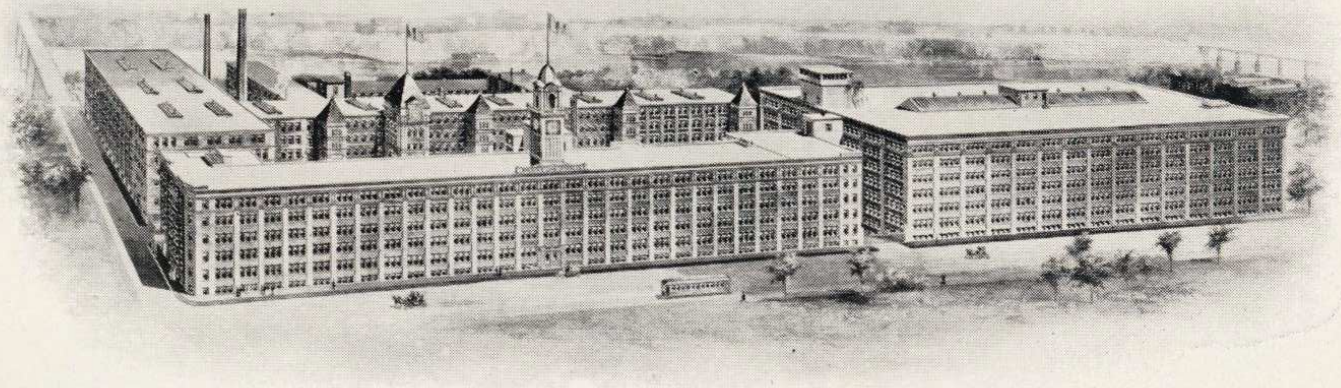


Executive Office and Manufactory of the Bausch & Lomb Optical Co., Rochester, N. Y.

An Eye for Distant Things

Nature enthusiasts often remind us of the superlative enjoyment of life open to the careful observer. They tell us how much more a walk across the fields, a ride through the country, a hunt in the woods or a sail on the lake means to an individual blessed with the instinctive power of seeing things about him, than to one who centers his attention on things under foot. The one uses his eyesight to stimulate and satisfy his emotions; the other "keeps an eye out" for possible pitfalls, and that is about all.

This enjoyment of details in Nature is curtailed, however, if dependent solely upon the power of human vision. "As far as the eye can reach" is a trite expression, but it does not mean very far after all. Have you never stood on some eminence, a high hill, a tower or mountain, and wondered what lay beneath those mysterious, hazy outlines in the distance?

Our Limited Eyesight

Perhaps a strange bird hovers over your head. You would study its contour and the coloring of its plumage, but with a whir of wings it passes out of your sight all too soon, alighting as a mere speck on a distant tree. Now you are on the water. A vessel passes out near the horizon, but you can discern neither its name nor its character. Signals are flying on the shore or on a distant craft, but you cannot read them without sailing out of your course.

Like all things mortal, you find your eyes have definite limitations. The brain, however, has come to the aid of the eye by devising means of materially stretching these limitations. Those means at first, represented in the ordinary telescope, were hard to buy, hard to carry and none too satisfactory in the work they did. The second step in their evolution, effected by combining two telescopes in the ordinary field glass, was more satisfactory but still far from perfection.

The Ideal Glass

The ideal, as well as our present conception can comprehend, has been attained in the **Bausch & Lomb Stereo Binocular.** It was rendered possible by the successful application of the **Porro prism** to the field glass by Professor Abbe, of the Carl Zeiss Optical Works, of Jena, Germany, long recognized as leaders in the optical world. A further step toward its consummation came with the **increased stereoscopic feature,** which was originated by the same firm.

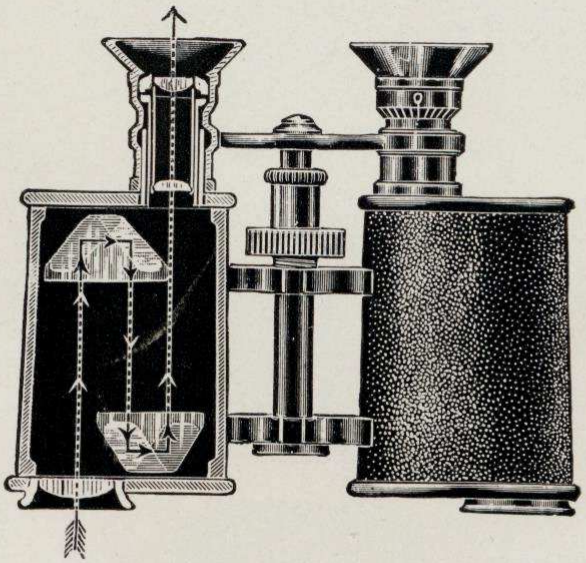
These glasses have been very generally copied but, as offered by us, represent the **original stereo prism binoculars.** Behind them is our wide experience of more than 60 years, designing and manufacturing practically every type of high grade optical instrument.

Functions Of the Prisms

The Porro prisms serve a **double purpose** in the field glass. They constitute a very compact erecting system, causing the object to appear in the ocular in the same position as when viewed by the naked

eye. Without such a system all images produced by the glass would be inverted. They also occasion a material shortening of the binocular, bending the rays upon themselves, as shown in the accompanying illustration. The result is a glass of a convenient size and weight, even in some of the higher powers, to be carried easily in the pocket.

Thus has the prism revolutionized the field



Section Showing Prisms and Path of Light Rays

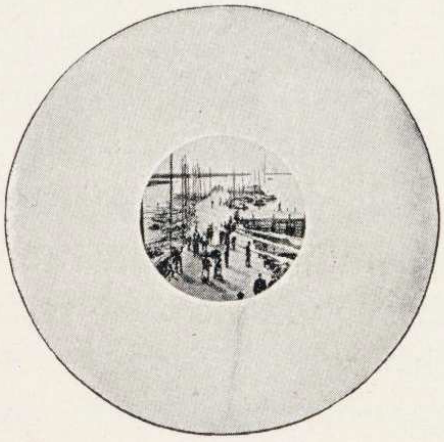
glass in size and efficiency. The method of obtaining increased stereoscopic vision by placing the objectives farther apart than the eyepieces was also an invention of Professor Abbe, and he was granted letters patent in nearly every civilized country of the world. The feature has been adopted on all of our binoculars. It is of great value in enabling the user more accurately to judge distances and the relative position of objects.

Points of Superiority

Aside from their superior stereoscopic effect, light weight and compactness, the chief advantages which the **Bausch & Lomb Stereo Binoculars** show

Field of Bausch & Lomb Stereo Binocular Compared with Field of Ordinary Binocular of Same Power

over the Galilean, or ordinary type of field glass, lie in the **size of the field** and the **even illumination** and **definition** throughout the field—in everything, in fact, which counts for excellence in such an instrument.



Size of Object Viewed with Naked Eye

Size of Same Object Viewed with 8-Power Glass

Size of Same Object Viewed with 12-Power Glass

The illustrations on the opposite page depict these differences as accurately and clearly as they can be shown on paper. The field of our binocular has about nine times the area of the Galilean, while the illumination is more evenly distributed. The ordinary glass shows a decided falling off in illumination at the margins, as indicated in the cut.

Magnifying Power

One of the chief considerations in making a selection from our line of binoculars is the power desired. By the term "power" we mean the number of magnifications, which a glass will give, of the apparent size of a distant object or, in other words, the number of times nearer it will seem to bring that object. It is usually expressed by the multiplication sign, following the number. An object, for example, which is discernible to the naked eye at a distance of one mile, can be seen at a distance of 6 miles through a 6-power glass, 8 miles through an 8-power glass, or 12 miles through a 12-power glass.

One might wonder, then, why a high power glass would not always be preferable for outdoor work because of its greater range, but there are other principles to be considered. The low power glasses give the larger field, or wider visual angle, and the greater illumination. If a higher magnification is desired, it can only be obtained, according to a law of optics, at a sacrifice of field and illumination. This relation of magnifying powers and objective fields, both angular and linear, is indicated by the figures given in the separate descriptions and in the table on page 20.

Our Binoculars

Our line of binoculars has been designed to meet these conditions most satisfactorily. By constructing instruments with **objectives of as large diameter** as possible greater illumination is obtained. It is a function of the objective to collect the light

rays coming from the object viewed, and by means of these image-bearing rays the picture of the object is depicted upon the retina of the eye. It is obvious, then, that the larger an objective, the more light rays it will collect and the brighter and clearer will be the image.

Illustrations and descriptions of our different glasses, with complete specifications, will be found on subsequent pages. Under the description of each glass we have endeavored to guide the purchaser by enumerating some of the uses for which it is particularly adapted.

Careful Construction

All of our binoculars are constructed with the greatest care and precision, optically and mechanically. The lenses are carefully ground and polished and of the finest correction. The prisms are of **special optical glass,** so transparent that practically no light is lost in passing through them. The reflecting surfaces are ground and polished with the greatest accuracy.

The mountings are of aluminum, **very light and compact.** The barrels are suitably ribbed for strength and are so constructed as to **exclude dust and dampness.** They are covered with vulcanized rubber, finished to resemble Morocco leather. This covering has been substituted for the leather, as it has been found more durable and moisture proof, while equally attractive in appearance. All exposed metal parts are neatly lacquered in black, and each glass is marked with its power and the diameter of its objectives.

Adjustments

Three adjustments on all of our glasses render them adaptable to any pair of eyes, abnormal or normal. The two barrels turn on a central hinge, enabling one to obtain the **correct pupillary distance,** or distance between the eyes. Graduations are provided on this hinge so that the individual user, once having determined the pupillary distance fitted to his eyes, can turn to it at once.

The eyepieces are focused in two ways. Our binoculars are provided with the **universal focusing attachment,** a convenient knurled thumb screw between the barrels, by which the two eyepieces are adjusted simultaneously and evenly. For a person with normal eyes this is sufficient. For those with eyes of unequal vision we make our glasses with one adjustable eyepiece and one fixed, the latter being focused by the universal adjustment. The adjustable eyepiece is graduated for convenience in focusing.

Accuracy in all these adjustments is very essential to the satisfactory use of a field glass. The **correct pupillary distance is necessary** in order to have the fields of the two objectives exactly coincide, while sharp definition is, of course, dependent upon accurate focusing, as well as upon the character of the lenses.

Metal loops, securely fastened to the mountings, provide means for attaching a neck strap, which is included with all the glasses. Each one

is also furnished in a handsome and durable carrying case of the best quality sole leather, provided with a suitable shoulder strap.

Binoculars in Carrying Case with Shoulder Strap

Bausch & Lomb
6X, 21 mm Diameter Stereo Binocular

(½ Actual Size)

This is an eminently satisfactory glass for the study of birds and animals. Because of its greater illumination it is distinctly superior to glasses of higher powers for work in the woods or in foliage, where the sunlight is of necessity limited.

This is also a desirable instrument for use at races and games, or to observe any objects in motion. The field is large and the magnification sufficient for such a purpose. It gives an angular field of 6.8°, or a linear field 120 yards wide at a distance of 1,000 yards.

The glass is of a convenient size and weight to carry and because of its comparatively small diameter is easy to hold. Its length closed is 3½ inches and its width 5⅛ inches; its weight is 21 ounces

Code		Price
Jaina	**Bausch & Lomb Stereo Binocular,** 6X, 21 mm diam., in case with straps	**$50.00**

Bausch & Lomb
6X, 30 mm Diameter Stereo Binocular

(½ Actual Size)

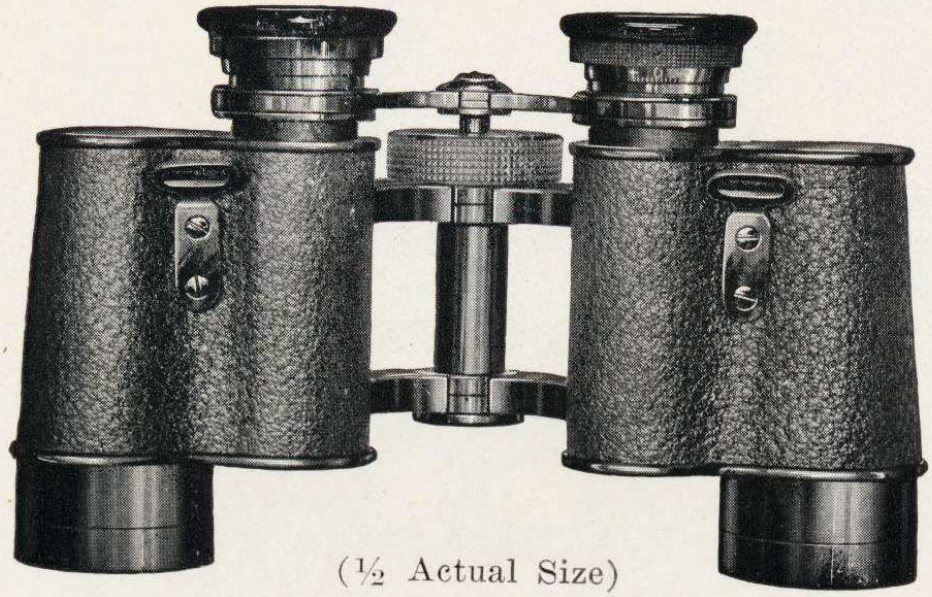
This is one of our most popular glasses. While possessing no higher magnifying power than the glass just described, it has unusually large objectives, giving as a result the greatest illumination and the widest field of any of our binoculars. It is a remarkable glass in these respects.

Because of its superior illumination it is what is known as a **night glass,** and we know of no better one. It is just the instrument for use in the twilight or dusk, on a cloudy day, in a fog or under any unfavorable weather conditions, while in good light it gives particularly brilliant results. It is also a valuable "stalking glass" for the hunter and very suitable for nature study.

The glass gives an angular field of 8.4°, while its linear field measures 150 yards across at a distance of 1,000 yards. It weighs 24¼ ounces and measures, when closed, 4¼ inches in length and 5½ inches in width.

Code		Price
Jackstay	**Bausch & Lomb Stereo Binocular,** 6X, 30 mm diam., in case with straps	- **$60.00**

Bausch & Lomb
12X, 30 mm Diameter Stereo Binocular



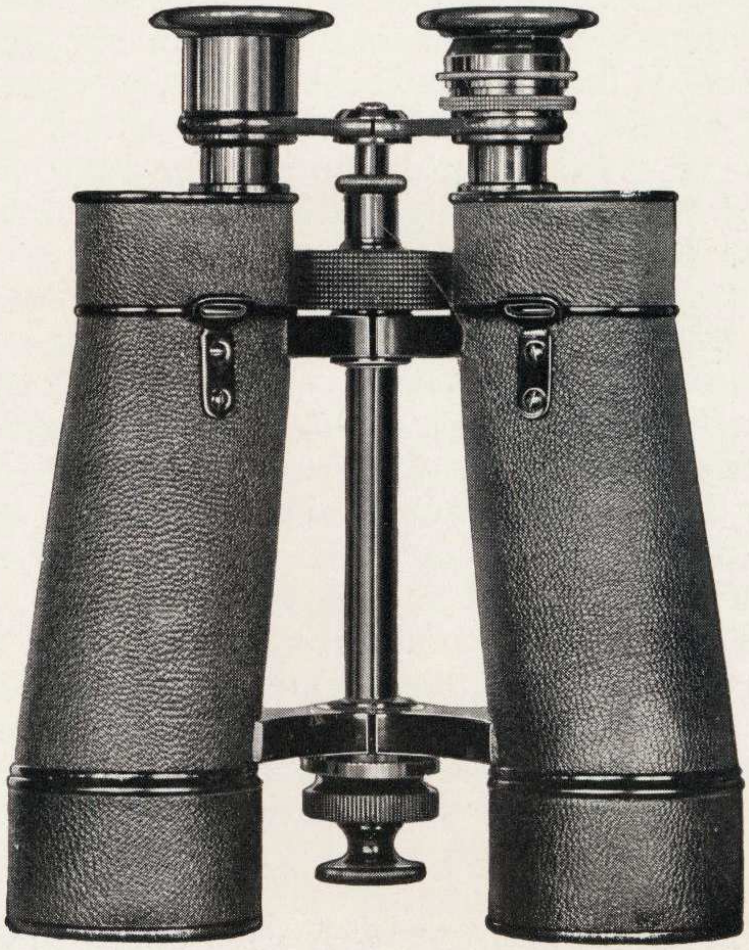
(½ Actual Size)

This glass possesses the highest magnifying power which we thus far have considered practical to embody in a hand telescope. It is impossible to hold a glass of higher power steady enough in the hands to obtain a clear and well defined image.

While the illumination and the field are of necessity secondary to the magnification in this glass, we have offset these difficulties as far as possible by enlarging the objectives materially. The result is a glass which will give remarkable results in good light, particularly in work at great distances. It is specially recommended as a **day marine glass,** also for military men, sportsmen and explorers—for use wherever a high magnification is the chief consideration.

The glass gives an angular field of 3.3°; its linear field is 58 yards in extent at a distance of 1,000 yards. It measures closed 3¾ inches in length and 5½ inches in width, while its weight is 25 ounces.

Code		Price
Jarnut	**Bausch & Lomb Stereo Binocular,** 12X, 30 mm diam., in case with straps	**$75.00**



(⅔ Actual Size)

10X, 45 mm Diameter Stereo Prism Marine Glass

MB

Bausch & Lomb
10X, 45 mm Diameter Stereo Prism Marine Glass

We have designed this glass particularly to meet the requirements of Navy and Army officers and of navigators in general. It is a wonderfully effective combination of a high power and brilliant illumination, accomplished by coupling exceptionally large objectives with our usual high grade optics. The increased stereoscopic feature is also of great value in noting the relative position of vessels, tracing a distant coast line or in similar observations.

The United States government possesses a large number of these glasses, which are giving very general satisfaction. We believe that no other glass of so high a power can be more satisfactorily used in cloudy, stormy weather, or in a dusky light. Sportsmen and yachtsmen accordingly appreciate it as much as the more serious purposed officials of the government.

While the enlarged objectives and longer focus necessitate an instrument of larger dimensions than our other binoculars, it is gracefully designed and unusually convenient, for such a glass, to carry and hold. The dimensions closed are 7⅝ inches, length, and 6¼ inches, width, while the weight is 31½ ounces.

This glass is fitted with a clamping device on the central hinge, so that the individual user, having determined his correct pupillary distance, can set it and thereafter open the glass at once to his adjustment. It is also provided with leather sun shades for the objectives. The instrument covers an angular field of 4.5° and a linear field 79 yards in breadth at a distance of 1,000 yards.

Code		Price
Jaspoid	**Bausch & Lomb Stereo Prism Marine Glass**, 10X, 45 mm diam., in case with straps	**$90.00**

Summary — Specifications and Prices

Code Word	Linear Magnification (Power)	Diameter of Objectives in mm	Objective Field		Weight in oz.	Dimensions in Inches		Price
			Angular	Linear in Yards at 1,000 Yards		Length	Width	
Jaina	6×	21	6.8°	120	21	3½	5⅛	$50.00
Jackstay	6×	30	8.4°	150	24¼	4¼	5½	60.00
Janker	8×	21	5.1°	90	15½	4⅛	5	50.00
Jar	8×	25	6.6°	115	20	3½	5⅛	55.00
Jarnut	12×	30	3.5°	58	25	3¾	5½	75.00
Jaspoid	10× (B. & L. Marine)	45	4.5°	79	31½	7⅜	6¼	90.00

Other Products

We enumerate below a partial list of our products. We shall be glad to furnish literature or information on any of them upon request.

Astronomical Instruments
Bacteriological Apparatus
Centrifuges
Chemicals
Engineering Instruments
Electric Incubators
Laboratory Apparatus
Magnifiers
Microscopes
Microtomes
Ophthalmic Lenses and Instruments
Photographic Lenses and Shutters
Photomicrographic Apparatus
Projection Apparatus
(Balopticons and Accessories)
Reading Glasses

Bausch and Lomb Optical Co.
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LONDON ROCHESTER, N. Y. FRANKFORT

M. E. STERN
71 Nassau Street
NEW YORK CITY