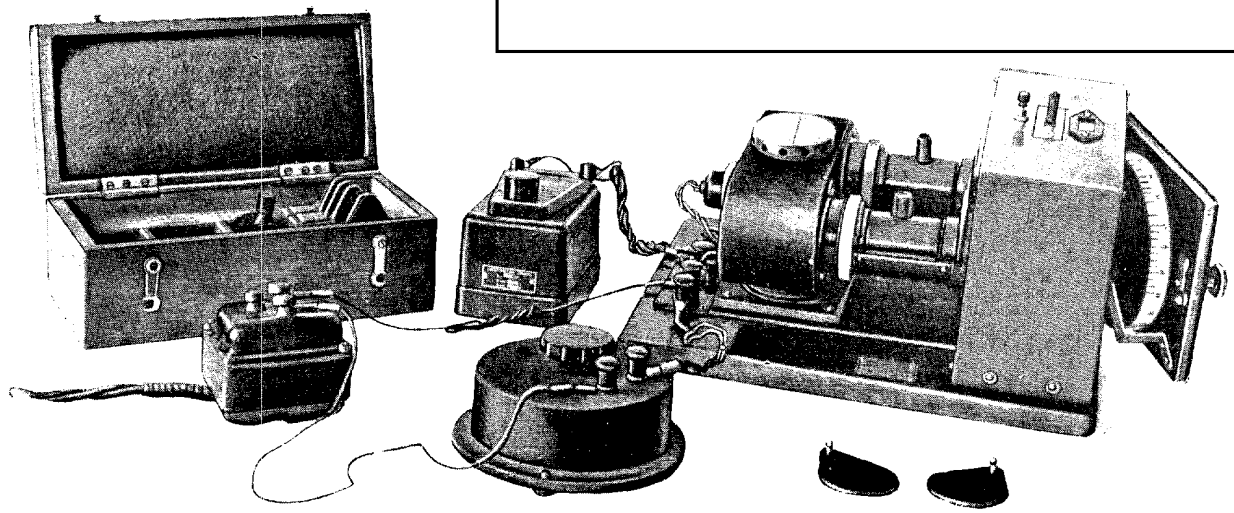
v/o „Stankoimport"

25X1



Model Ц-3а

Colorimeter

COLORIMETER

MODEL Ц-3А

Photocolorimetric aralytical methods are finding wide application not only in processing of food and chemical products, but also in ferrous and non-ferrous metallurgies. In many cases photocolorimetric methods of analysis have many advantages over standard methods: economy of reagents, platinum vessels are unnecessary, considerably less operation time is required.

The Ц-3А Colorimeter is used for estimating the concentration of transparent solutions by the depth of their colour.

The operation of the instrument (Fig. 1) is based on the property of solutions to absorb part of the light passing through a layer of the liquid and on the property of photoelectric cells to generate electric current when light falls on them.

Light is passed simultaneously through two cups: one filled with a standard solution and the other with the solution to be tested. The cups are placed between the light source and the photocell apertures.

The amount of light passed through the solution is determined by introducing an additional resistance.

A 21 c. p. motor car type electric bulb is used for illumination, suitable for 120-volt A. C. supply through a 6-8-volt transformer.

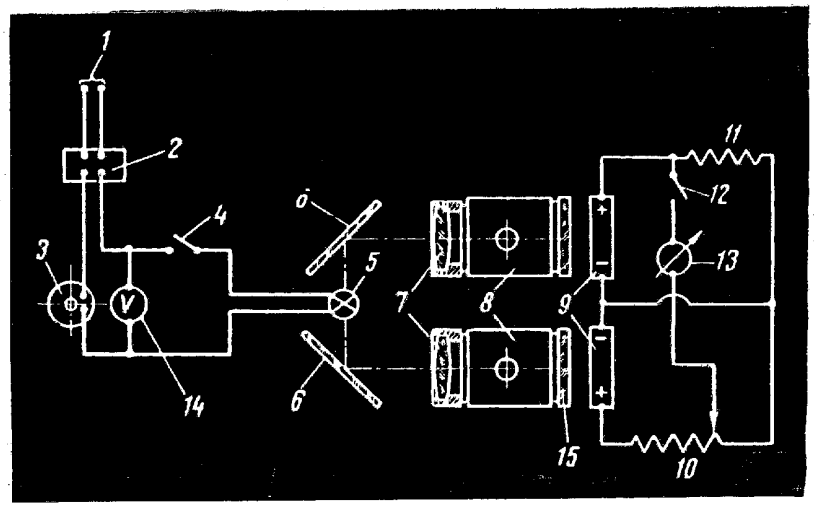


FIG. 1 Diagram of instrument

1 — A. C. supply, 120-volt. 2 — Transformer, 120/6-8 volt. 3 — Filament rheostat, 3 ohm. 4 — Bulb switch. 5 — Bulb. 6 — Mirrors. 7 — Objectives. 8 — Cups with solutions. 9 — Photocells. 10 — Variable resistance. 11 — Constant resistance coil. 12 — Galvanometer push-button switch. 13 — Galvanometer. 14 — Voltage supply control voltmeter. 15 — Light filters.

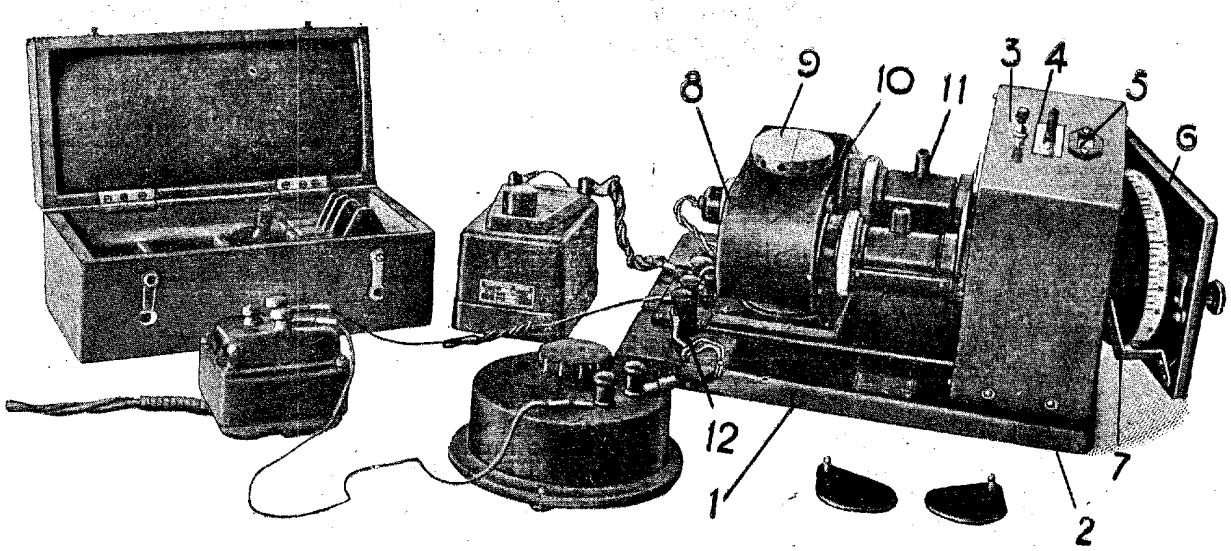


FIG. 2. General view of the Colorimeter

FEATURES OF THE Ц-3А COLORIMETER

All parts of the instrument (Fig. 2) are mounted on a wooden panel (1). On one side on the panel is located a wooden housing (2) containing the photoelectric cells, the variable resistance and the coil. One housing wall has apertures through which light passes to the photocells. On the top of the housing are: the galvanometer push-button switch (3), the bulb switch handle (4) and the opening (5) through which the variable resistance scale can be viewed. The other housing wall is a hinged door (6) with the variable resistance disc (7) and control handle mounted thereon. On the other side on the panel is located a metal housing (8) containing the lamp. In the center of the housing (9) is attached the bulb with two mirrors, one on each side. In the lamp housing wall are mounted two lenses with diaphragms adjusted by means of knurled rings (10).

Between the lenses and the wooden housing two cups (11) are inserted. One is filled with the standard liquid, and the other with the sample solution. Ebonite plates are interposed between the cups and the apertures to protect the photocells from extraneous light. Before operation these plates are removed and replaced by light filters.

On the left on the panel are four terminals (12).

SPECIFICATIONS

Measuring range — from 0 to 100% absorption.
Scale reading — 1%.
Scale reading accuracy — 1%.
Overall dimensions of instrument — 343×210×205 mm.
Weight of instrument — 8.6 kg.

STANDARD EQUIPMENT

Zero galvanometer.
Transformer for 6—8 volts
Filament rheostat, 3 ohm.
4 Cords with plugs.
3 Glass cups, 50 mm long.
Ground glass plates.
2 Red light filters.
2 Yellow light filters.
2 Blue light filters.
Smoked glass plate.
2 Ebonite plates.
Case for cups and filters.
Operating instructions.
Certificate. Carrying case.

Vsesojuznoje Objedinenije

„S T A N K O I M P O R T"

exports and imports:

Machine Tools.
Metal Working Machinery.
Woodworking Machinery.
Measuring Instruments and Apparatus.
Testing Machines and Instruments.
Optical Instruments and Equipment.
Portable Electric and Pneumatic Tools.
Metal and Wood Cutting Tools.
Mechanic's Tools and Chucks.
Carbide Products.
Abrasive Products.
Ball and Roller Bearings.
Metallographic, Biological and Medical Microscopes
Motion Picture Equipment and Accessories.
Geodetic Instruments and Equipment.
Photo-Equipment, Binoculars, Magnifiers, Lenses, ets.

* * *

All enquiries and correspondence to be forwarded to:
Moscow 168, ul. Kuibysheva, 21
Vsesojuznoje Exportno-Importnoje Objedinenije „S T A N K O I M P O R T"

For cables: Stankoimport Moscow
Phone: K 5-54-84.

* * *

Desing and specifications of instruments
listed herein are subject to change without notice.

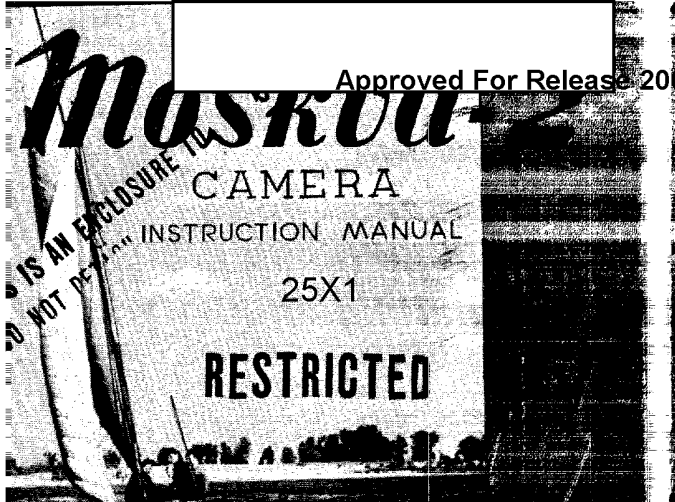
Moskva-2

CAMERA

INSTRUCTION MANUAL

25X1

RESTRICTED



General features

The "Moskva-2" (Fig. 1) is a folding hand-held camera designed for landscape, portrait and group photography, separate sport shots, etc. It uses a film with 6×9 cm size of picture and may be loaded in daylight.

The camera is loaded with roll film, the spool capacity being 8 pictures; it can be operated either hand-held or set on a tripod.

The camera is equipped with a view-finder and an optical range-finder coupled with the lens focusing mechanism.

Focusing is done by adjusting the range-finder which brings together two images of the same object photographed.

The "Moskva-2" is furnished with a central type shutter having an iris diaphragm and giving automatic exposure speeds ranging from $^1/_{250}$ sec. to 1 sec. The "B" setting permits to keep the shutter open for much longer intervals.

The great advantages of the "Moskva-2" camera are incorporated in its speedy operation and convenient handling.

Means for speedy setting are provided by convenient arrangement of distance, lens opening, depth of field, and exposure speed scales.

The number of exposures made is indicated by figures printed on the film protective paper and appearing in the red film window.

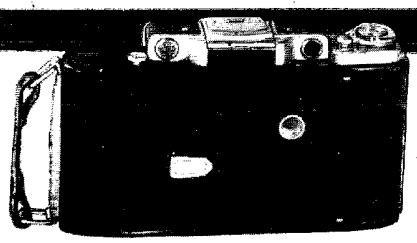


Fig. 1

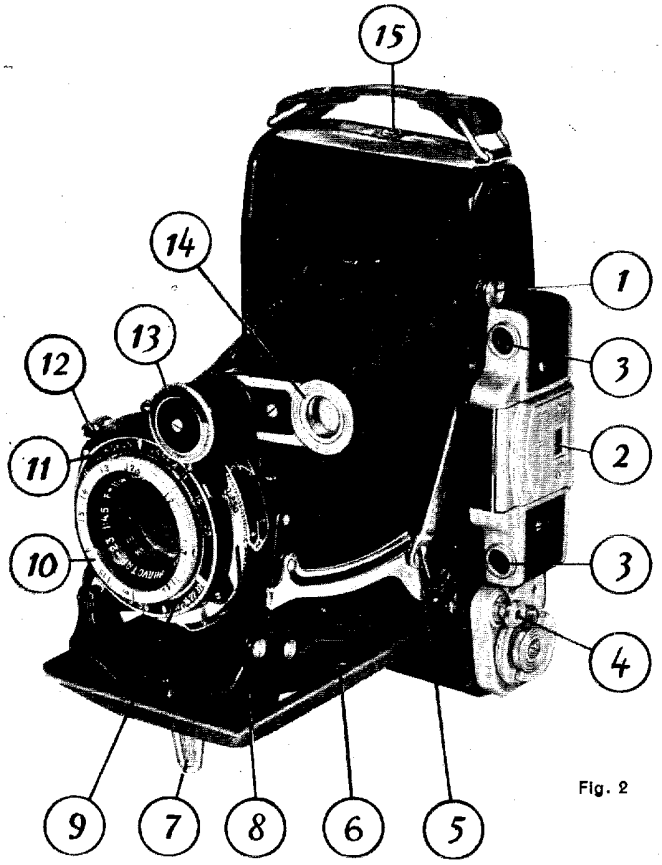


Fig. 2

Specifications

Size of picture	6 × 9 cm
Film spool capacity	8 pictures
"Industar-23" lens:	
focal length	110 mm
full aperture	f 4.5
angle of field (diagonal)	52°
Lens opening scale	f 4.5; f 5.6; f 8; f 11; f 16; f 22; f 32
Distance scale	1.5; 1.7; 2; 2.5; 3; 4; 5; 8; 15 m and infinity
Shutter exposure speeds	1; $\frac{1}{5}$; $\frac{1}{10}$; $\frac{1}{25}$; $\frac{1}{50}$; $\frac{1}{100}$; $\frac{1}{200}$; $\frac{1}{500}$ of a second and "B" (Bulb)
Range-finder base	65 mm
Camera overall dimensions:	
folded	48 × 95 × 165 mm
in operating position	130 × 125 × 165 mm
Camera weight	860 g

"Moskva-2"

represents a modern development of the folding roll film type of camera and incorporates many refinements which make picture taking easier, and good results more certain.

It is a precision instrument and should receive careful and intelligent handling. This manual gives you quickly and simply the essentials of camera operation.

Read it carefully.

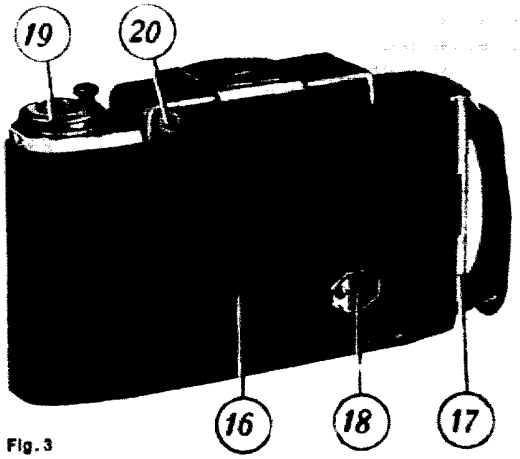


Fig. 3

18—Back cover
17—Back cover locking frame
18—Film window
19—Film winding knob
20—Range-finder eyepiece

Figs. 2 and 3 show general view of the camera.

The camera body is strongly built and handsome in appearance. Lens and shutter click smartly into place and fold away as swiftly.

The camera is opened and set to operation after the button 1 (Fig. 2) on the right side of the view-finder 2 has been pressed. The front cover 6 and view-finder 2 open simultaneously.

Camera Construction

1 Camera opening button
2 View-finder
3 Range-finder object glasses
4 Shutter release button
5 Hinged arm
6 Front cover
7 Front cover collapsible support
8 Exposure speed setting ring
9 Lens opening scale
10 Distance scale
11 Depth of field scale
12 Shutter winding lever
13 Focusing mechanism knurled wheel
14 Range-finder compensator
15 Back cover opening button

ne camera is folded by pressing the hinged arms 5 attaching ont cover to camera body and then by pushing back the mera front cover until it locks.

wo bushings one on the side of the camera body and the her on the front cover allow for taking pictures from tripod, e camera being set in either horizontal or vertical positions.

he camera front cover 6 is provided with a collapsible upport 7 allowing the camera to be set on a table or other at surface.

he view-finder 2 consists of two lenses fitted in mounting ames. When the camera is opened the view-finder opens multaneously, and under the action of springs, the front and ar frames are set to operating position.

he objective is a four-lens anastigmat giving sharp images nd ensuring superior quality of the pictures taken. The lenses e coated.

he shutter "Moment-1" is of the between-the-lens type. he exposure speeds are changed by turning the exposure etting ring 8 (Fig. 2) until the index line is opposite figure dicating the desired speed. Previous to making the exposure e shutter should be wound. This is done by clockwise turning the shutter winding lever 12 until it comes to a stop.

he shutter is released by pressing the release button 4 in as r as it will go.

he release button 4 (Fig. 2) and the film winding knob 19 (Fig. 3) e interlocked thus preventing accidental double exposures. ou cannot release the button until the winding knob has been rned and the film advanced to the next exposure number.

The diaphragm is positioned inside the shutter between the objective lenses and controls the lens opening or in other words the amount of light that passes through the lens while the shutter is open. The size of the lens opening is changed as the lever is moved across the lens opening scale 9. The opening is smallest when the lever is at f/32. Each succeeding setting admits, in a given exposure time, twice as much light as the one before — f/22 lets through twice the light of f/32, f/16 twice that of f/22, and so until f/4.5 the largest opening is reached.

Lens opening and shutter speed work together, although adjusted separately, to admit the right amount of light to the film.

The figures engraved on the shutter and lens opening scales show only fraction denominators; for example, 50 instead of 1/50, 4.5 instead of f/4.5, etc.

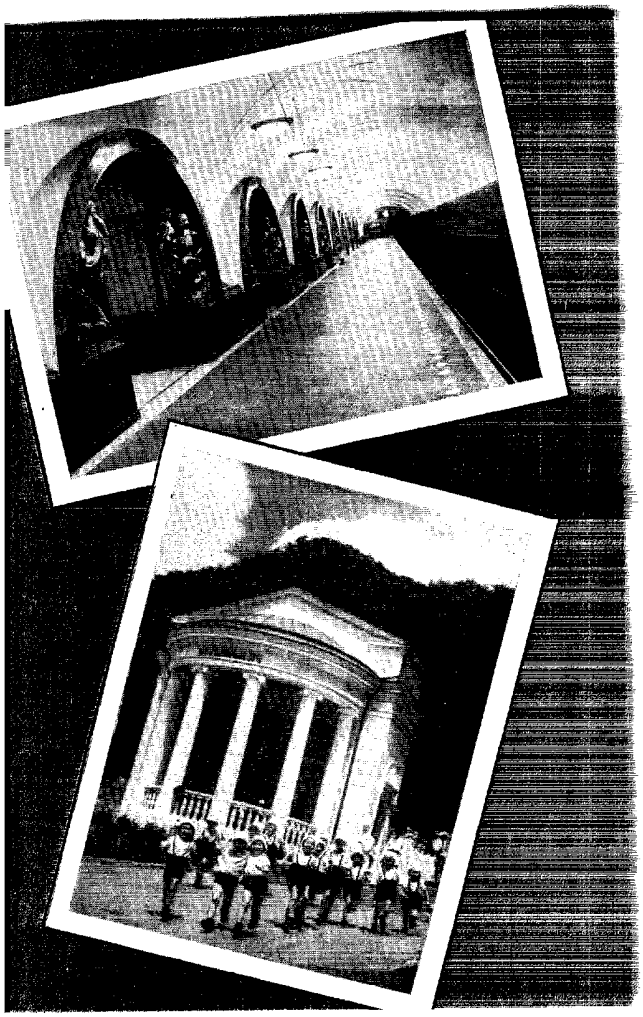
The depth of field is the distance between the nearest and farthest objects in a scene which will be sharp in the picture. Note that the depth of field increases as the lens opening is made smaller, or as the distance focused upon is increased.


f/4.5


f/5.6


f/8


f/11



The camera back cover 16 (Fig. 3) can be opened after the button 15 (Fig. 2) on the locking frame 17 (Fig. 3) has been moved in the direction indicated by the arrow.

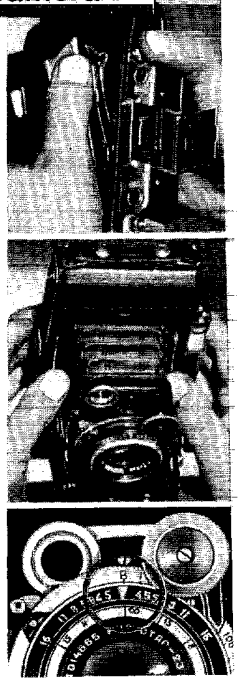
The back cover is closed by pressing it back until it catches.

Opening and Closing the Camera

To open the camera press button 1 (Fig. 2) on the side of the camera body. The front of the camera will pop out to picture-taking position. The view-finder opens simultaneously.

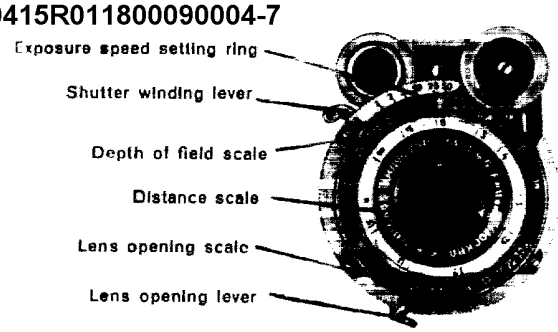
To close the camera fold up the front and rear frames of the view-finder 2. Press the hinged arms 5 (both the right and the left arms are to be pressed simultaneously) and slightly push up the camera front cover 6 until it locks.

Caution. Never close the front cover until the lens (with the filter removed) has been set to infinity (∞) and the range-finder compensator 14 to inoperative position.



A great range of sharpness is desirable in many pictures, particularly in landscapes. Since most objects of interest are at a considerable distance from the camera in such pictures, no difficulty is usually encountered in obtaining the required range of sharpness. However, it is sometimes desirable to record sharply an object near the camera as well as objects at an extreme distance. In such cases, reference to the depth of field scale 11 (Fig. 2) will help you set lens opening and focus to get a depth of field which will cover objects at both positions. Finding on this scale on both sides of the center index figures corresponding to the lens opening value, you will see on the distance scale 10 (opposite the depth of field scale figures) two figures indicating the distance range at which the object will show sufficient sharpness.

Focusing the camera in a more simplified manner is made possible by using the so-called two-dot system. One red dot is marked on the distance scale 10 indicating a 10 m distance and the other on the lens opening scale 9 indicating a lens opening of approximately f 11. Thus, should the "red dot" setting be used sufficient sharpness of the object will be obtained for any distance ranging from 4.5 m to infinity (∞) and the photographer will not have to worry about focusing. This feature is very convenient especially when taking casual tourist shots: to snap a picture it being necessary just to open the camera, wind the shutter and press the release button.



Night scenes (or when the light is not bright enough) require exposures much longer than the measured intervals provided on the shutter. For such pictures the "B" (Bulb) setting is used. After setting the shutter at "B" the release button 4 is pressed in and held. The shutter will remain open until you release it.

You can hold the camera in your hands for exposures of $\frac{1}{30}$, $\frac{1}{15}$, $\frac{1}{8}$ or $\frac{1}{4}$ of a second; for longer exposures the camera must be placed on a tripod or other firm support. In such cases the shutter release may be operated by means of a release cable; for this purpose the release button 4 is provided with a tapped hole into which the release cable is to be screwed.

Camera Loading

The camera may be loaded in a usual but not too bright light. This is made possible because the camera operates on film provided with protective paper.

To load the camera follow these steps:

1 Move the button 3 (Fig. 4) on the locking frame 4 in the direction of the arrow and open the camera back cover 9.

2 Break the seal on the roll of film and place the spool on the supporting pins 1, 2. To do this, insert the pin 2 into the hole of the film spool and pushing the spool against the pin bring it out of the camera until the spool flange rests against the side of the case. Then, insert the pin 1 into the hole of the spool. The spool must be inserted so that when the protective paper is drawn off, the emulsion side of the film will pass over the focal frame 5 and be turned toward the lens.

3 Remove the take-up spool 8 from the supporting pins 6, 7, thread the wedge-shaped end of the protective paper through the spool slit and unwind the film until the conventional markings (usually two triangles) appear on the paper. Bind the protective paper securely to the take-up spool (1 or 1.5 turns are sufficient) and replace it on the supporting pins 6, 7.

The range-finder determines the camera-to-subject distance. It is automatically coupled with the lens focusing mechanism. The distance measuring principle of the range-finder is based on bringing together two images of the same subject by means of rotating wedges. The subject is viewed through the eyepiece 20 (Fig. 3) and two object glasses 3 (Fig. 2).

To facilitate the accurate superimposing of the two images in the range-finder, one of the reflecting prism surfaces is made semi-gilded and the two images are thus easily distinguished as each image appears in a different colour.

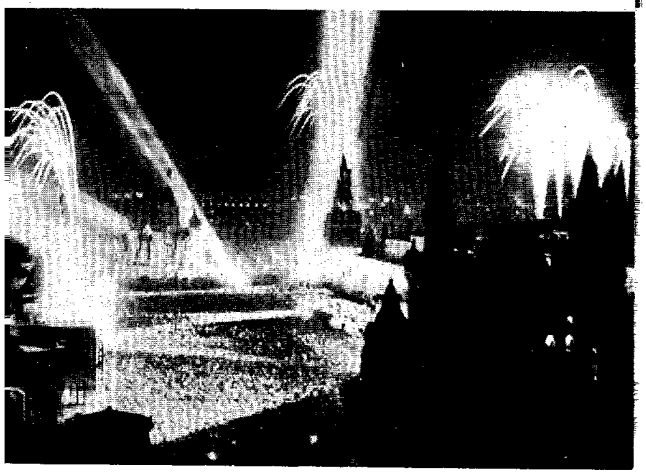
While the images are brought together the movement is automatically imparted to the lens, thus focusing it in accordance to the distance being measured.

Focusing is done by turning the knurled wheel 13 (Fig. 2).

The distance scale 10 is engraved on the lens mount and indicates (in meters) various distances from the first objective lens to the subject.

4 Turn the film winding knob 11 and engage the pin key with the slot in the end of the take-up spool. Continue turning the winding knob to securely fit the protective paper on the take-up spool (while this is done be sure the upper film spool is not rotating on its pins); then close the back cover.

5 Open the metal slide that covers the red film window 10 on the back of the camera and turn the winding knob 11 until an arrow or a small hand printed on the protective paper appear in the red window. Continue winding slowly until the figure "1" is centered in the window.
Push the metal slide and close the red window. The film is now in position for your first picture.



1, 2—Film spool supporting pins
3—Back cover opening button
4—Back cover locking frame
5—Focal frame
6, 7—Take-up spool supporting pins
8—Take-up spool
9—Back cover
10—Red film window
11—Film winding knob
12—Range-finder eye-piece
13—View-finder
14—Range-finder compensator

Taking the Picture

1 Set the shutter exposure speed by turning the exposure ring 8 (Fig. 2) until index line is opposite speed desired.
2 Set the lens opening by moving the lens opening lever across the scale 9.
3 Wind the shutter by clockwise turning of the shutter winding lever 12 until it comes to a stop.
Caution: Never set the exposure speed setting ring 8 **after** the shutter has been wound as there is danger of breaking the shutter mechanism.

4 Set the range-finder compensator 14 to operating position. Look through the eyepiece 20 (Fig. 3) and focus by turning the knurled focusing wheel 13 (Fig. 2) until both images of the subject are exactly superimposed.

5 Look through the view-finder 2 — it shows you what will be included in the picture.

6 Make the exposure by slowly pressing the release button 4 in as far as it will go. Take care no to move the camera during the exposure, or the picture may be blurred.

7 Open the metal slide that covers the red film window 18 (Fig. 3) on the back of the camera and turn the winding knob 19 until the next exposure number appears in the window. Push the metal slide and close the red window; you are now ready for the next picture. Get into the habit of advancing the film immediately after taking each picture.

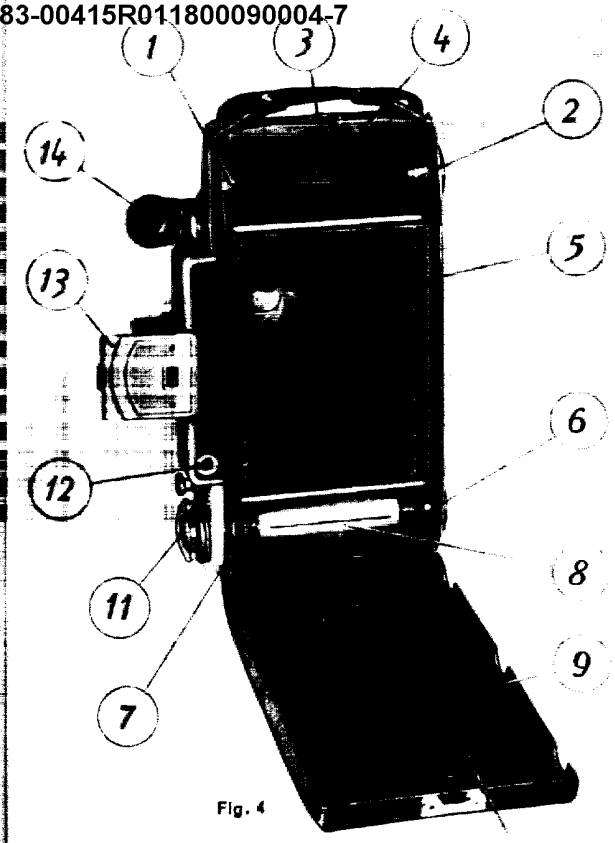


Fig. 4

Camera Unloading

The camera may be unloaded in daylight.

After all the exposures have been made, turn the winding knob until the end of the protective paper passes the red window. Then give the knob a few turns to wind all the paper into the take-up spool.

Open the camera back cover 9 (Fig. 4). Push the take-up spool 8 against the pin 6 to disengage the film winding knob 11 from the spool and remove it from the supporting pins 6, 7.

Seal the end of the protective paper and have the film developed as soon as possible.

Remove the empty spool from the pins 1, 2 and place it in the winding end of the camera on the pins 6, 7. Engage the slot of the empty spool with the pin key 7.

The camera is now ready to be reloaded.

Care of the Lens

It is quite evident that such a delicate and accurate piece of equipment as lens requires special care and can easily be ruined by careless handling.

To get the best out of your lens take good care of it:

Keep the lens surfaces free from dust and other impurities.

Should the surfaces show deposits of dust or other impurities do not try to remove it by rubbing the

Contents

VSESOJUZNOJE EXPORTNO-IMPORTNOJE OBJEDINENIJE
„STANKOIMPORT"
MOSCOW-USSR

Vneshtorgizdat Order No. 2139

surface with your fingers. You may wipe the surface with a piece of chamois or flannel. You may also use a fine camel-hair brush. In any case it is imperative that the surface be wiped very gently.

Never put your fingers on its surfaces.

Do not expose it for long periods to direct rays of the sun.

Do not subject it to sudden and extreme temperature variations, nor keep it in damp or warm places.

Never take it apart yourself for cleaning.

Camera Set

Complete camera set includes:
"Industar – 23" lens,
camera take-up spool,
cable release,
instruction manual and certificate of inspection.

"Moskva – 2" accessories supplied at extra cost

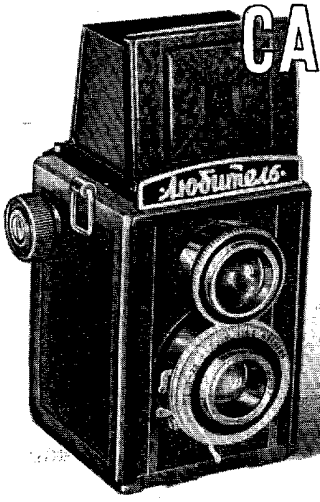
Yellow filter.
Orange filter.
Dark yellow filter.
Case for filters.

This material procured by
Central Intelligence Agency

IS IS AN ENCLOSURE TO
NOT DETA

Lubitel

CAMERA



RESTRICTED

SFSOJUZNOJE EXPORTNO-IMPORTNOJE OBJEDINENIJE

Stankoimport

7

GENERAL features

The "Lubitel" is a hand-held camera (Fig. 1) designed for amateur photographers. It uses a film with 6×6 cm size of picture and may be loaded in daylight.

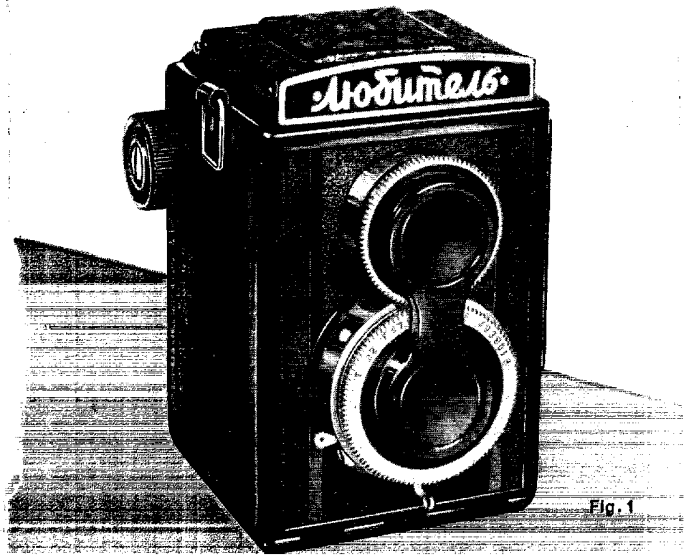


Fig. 1

The camera is loaded with roll film, the spool capacity being 12 pictures; it can be operated either hand-held or set on a tripod.

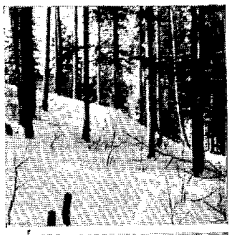
Focusing of the image is achieved by slightly turning the knurled lens mount.

Means for speedy setting are provided by convenient arrangement of distance, lens opening and exposure speed scales.

The number of exposures made is indicated by figures printed on the film protective paper and appearing in the red film window.

The mirror view-finder allows for photographing with the camera held in various positions; for instance, lifted above the operator's head or turned at a right angle to assume horizontal position, etc.

The frame view-finder is used for photographing at eye-level ; this is especially convenient when the amateur photographer has mastered correct focusing by means of the distance scale.



The camera body is built of plastics and is handsomely finished.

The camera is equipped with two view-finders, one of the optical (mirror) type, and the other of the direct (frame) type.

The "Lubitel" is fitted with a central type shutter having an iris diaphragm and giving automatic exposure speeds ranging from $^1/_{300}$ to $^1/_{10}$ of a second. The "B" setting permits to keep the shutter open for much longer intervals.

The great advantages of the "Lubitel" camera are incorporated in its speedy operation and convenient handling.

The mirror view-finder having been opened, a distinct and large image will be seen in the light-protective hood background, thus allowing for the camera position to be easily determined when the object has been already selected or when a new interesting object is being looked for.

"Lubitel" represents a modern development of the twin-lens type of camera. It shows you the picture before you take it, and incorporates many refinements which make picture-taking easier, and good results more certain.

It is a procision instrument and should receive careful and intelligent handling.

This manual gives you quickly and simply the essentials of camera operation.

Read it carefully.

CAMERA Construction

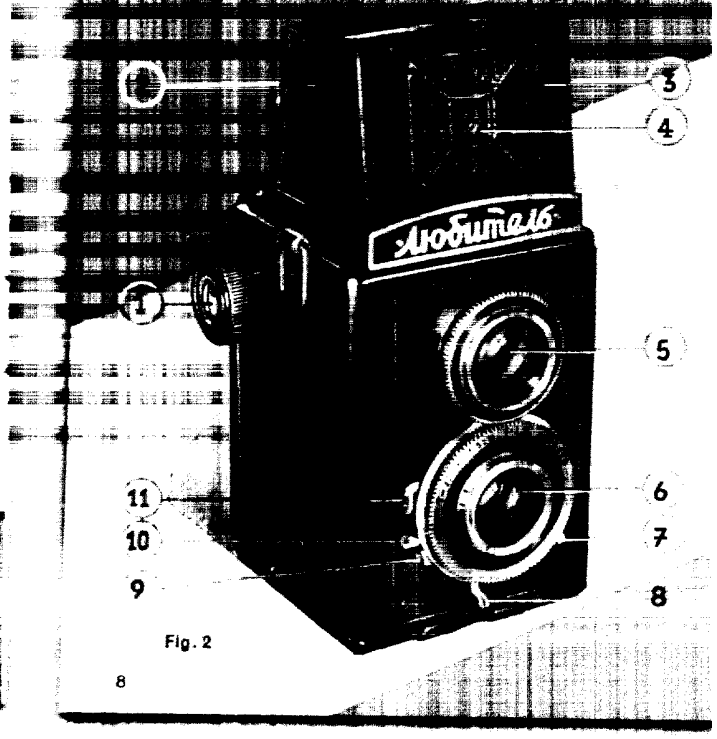
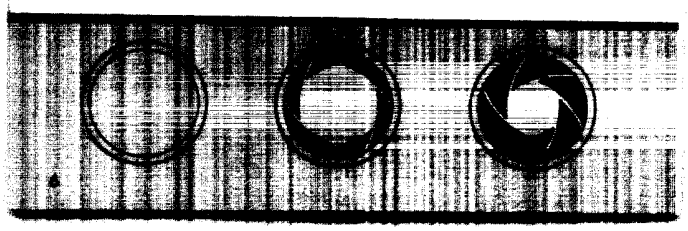


Fig. 2

Specifications

Size of picture	6×6 cm
Film spool capacity	12 pictures
"T-22" type lens:	
focal length	75 mm
full aperture	f.4.5
Lens opening scale	f.4.5; f 5.6; f 8; f 11; f.16; f 22
Distance scale	1.3; 1.5; 2; 2.5; 3; 5; 10 m. and infinity
Shutter exposure speeds	$^1/_{10}$; $^1/_{25}$; $^1/_{50}$; $^1/_{100}$; $^1/_{300}$ of a sec., and "B" (Bulb)
Camera overall dimensions:	
folded	90×95×120 mm
in operating position	90×95×170 mm
Camera weight	580 g



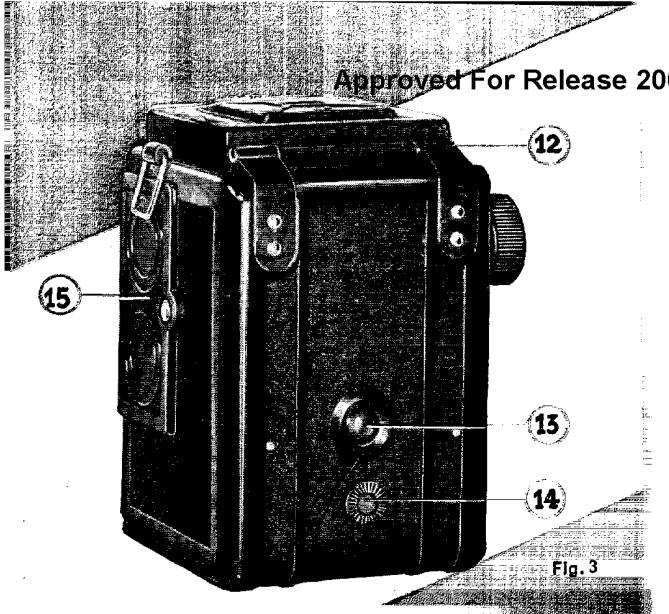


Fig. 3

Fig. 2:

1—Film winding knob; 2—Light-protective hood; 3—Front hood panel; 4—Front of hood bearing manufacturer's trademark; 5—Viewing lens; 6—Taking lens; 7—Lens opening lever; 8—Exposure speed setting lever; 9—Tapped hole for cable release; 10—Shutter release lever; 11—Shutter winding lever.

Fig. 3:

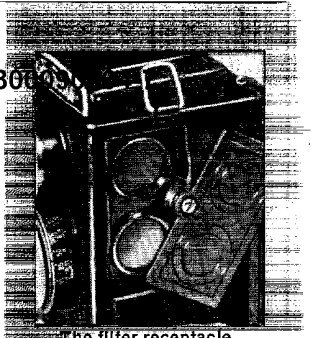
12—Hood lock; 13—Film window; 14—Film window cover knob; 15—Filter receptacle cover.

The taking objective is a three-lens anastigmat giving sharp images and ensuring superior quality of the pictures taken.

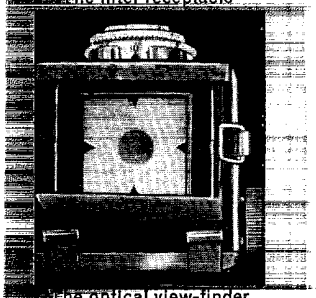
The optical view-finder is a combination arrangement of the view-finder proper and a ground glass representing a small circle in the middle of a biconvex lens with a hinged magnifier installed above it (Fig. 4). The view-finder is fitted with a metal light-protective hood which opens by opening its front panel.

The view-finder should be closed in a definite order: first the magnifier is to be closed and then, in sequence, the hood side walls, the rear hood panel and the front hood panel until it catches.

The viewing lens full aperture f/2.8 is much larger than that of the taking lens and is accordingly more sensitive when focusing.



The filter receptacle



The optical view-finder

The frame view-finder

The distance scale is engraved on the viewing lens mount. The divisions on the scale (in meters) indicate settings at various lens-to-object distances. With the largest lens opening and the lens set to the stop (indicated by ∞) excellent sharpness will be obtained at distances ranging from 18 m to infinity.

The shutter exposure speeds are changed by turning the exposure setting lever until index line is opposite figure indicating the desired speed. Any one of the five automatic exposure speeds $^1/_{200}$, $^1/_{100}$, $^1/_{50}$, $^1/_{25}$, and $^1/_{10}$ of a second can be selected.

Previous to making the exposure, the shutter should be wound by pressing the winding lever down to the stop.

When releasing the shutter the release lever (or release cable) is to be smoothly depressed.

Night scenes (or when the light is not bright enough) require exposures much longer than the measured intervals provided on the shutter. For such pictures the "B" (Bulb) setting is used. After setting the shutter at "B" the release lever is pressed down and held. The shutter will remain open as long as the release lever is depressed.

You can hold the camera in your hands for exposures of $^1/_{200}$, $^1/_{100}$, $^1/_{50}$, or $^1/_{25}$ of a second; for longer exposures, the camera must be placed on a tripod or other firm support.

The depth of field is the distance between the nearest and farthest objects in a scene which will be sharp in the picture. Note that the depth of field increases as the lens opening is made smaller, or as the distance focused upon is increased.

A great range of sharpness is desirable in many pictures, particularly in landscapes. Since most objects of interest are at a considerable distance from the camera in such pictures, no difficulty is usually encountered in obtaining the required range of sharpness. However, it is sometimes desirable to record sharply an object near the camera as well as objects at an extreme distance. In such cases, reference to the table will help you set lens opening and focus to get a depth of field which will cover objects at both positions (see depth of field table).

The table shows that with certain average lens openings and certain average focusing distances, practically all objects at distances from 3—4 m are reproduced with sufficient sharpness. These average lens opening (∞ f/10) and average focusing distance (∞ 8 m) are clearly marked in red dots on the corresponding scales of the "Lubitel" camera. Thus, under good lighting conditions, the "red dot" setting will give satisfactory results, and the photographer will not have to worry about focusing.

Image focusing occurs simultaneously on the ground glass circle and on the film, as both lenses are coupled by toothed mounts. The nearest distance for focusing is 1.3 m. Photographing of objects at closer distances calls for supplementary lenses.

Focusing is to be made in the matted circle centre.

Should the image, that is desired to be sharp, be located at the edge of the picture, the camera is to be slightly turned while focusing, and restored to its original position prior to shutter releasing.

The magnifier is attached to the optical view-finder hood on the inside and is used for critically sharp focusing. It is set to operation after having been pulled towards the photographer. The hood itself can be changed into a frame view-finder by pressing the front of the hood (bearing the manufacturer's trademark) back until it catches. The view-finder is closed by pressing back slightly on the rear hood panel.

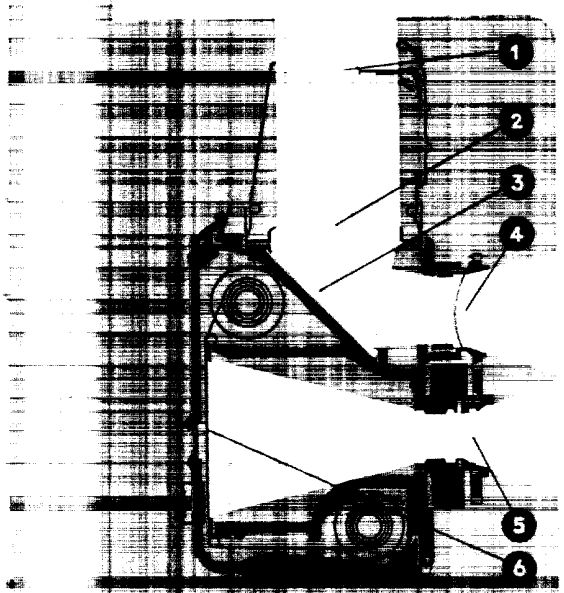
The camera should be held at eye-level when focusing and the object viewed through the square window in the rear hood panel at a distance at which the window edges "coincide" with those of the front hood panel opening. The boundaries of the field of view thus set shall also be boundaries of the photograph.

Figs. 2 and 3 show general view of the camera.

The camera body is made of plastics. A receptacle in the camera side wall fitted with a cover is provided for storing the filters.

A bushing in the camera bottom allows for taking pictures from tripod.

Fig. 4: 1—Magnifier; 2—View-finder lens with ground glass; 3—Mirror; 4—Viewing lens; 5—Taking lens; 6—Film.



Depth of Field Table for T-22 Lens (Focal Length — 75 mm)

Dimensions in meters

Distance focused on	f 4.5 Sharply focused from	f 4.5 to	f 5.6 Sharply focused from	f 5.6 to	f 8 Sharply focused from	f 8 to	f 11 Sharply focused from	f 11 to	f 16 Sharply focused from	f 16 to	f 22 Sharply focused from	f 22 to
∞	18	∞	11	∞	8.5	∞	6	∞	4.5	∞	3.3	∞
10	7	20	6	30	5	∞	4	∞	3.3	∞	2.5	∞
5	3.9	7	3.7	9	3.4	12	2.9	17	2.5	∞	2	∞
3	2.8	3.7	2.6	3.9	2.3	4.5	2.2	6	1.8	11	1.7	30
2.5	2.2	2.9	2.1	3.1	1.9	3.5	1.8	4	1.6	5	1.4	8
2	1.8	2.3	1.8	2.3	1.7	2.6	1.6	2.8	1.4	3.5	1.2	4
1.5	1.4	1.7	1.4	1.7	1.3	1.8	1.2	2	1.2	2.2	1	2.8
1.3	1.2	1.5	1.2	1.5	1.1	1.6	1.1	1.7	1	1.9	0.9	2.2

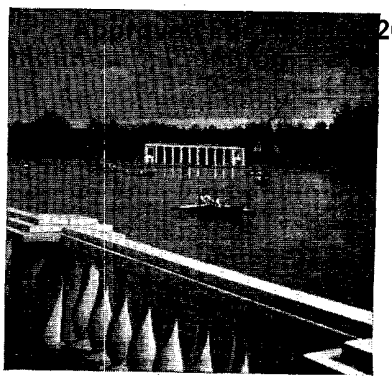
The diaphragm is positioned inside the shutter between the objective lenses and controls the lens opening, or in other words the amount of light that passes through the lens while the shutter is open. The size of the lens opening is changed as the lens opening lever is moved across the scale.

The opening is smallest when the lever is at f/22. Each succeeding setting admits, in a given exposure time, twice as much light as the one before — f/16 lets through twice the light of f/22, f/11 twice that of f/16, and so on until f/4.5, the largest opening, is reached.

Each shutter setting with which the camera can be hand-held also gives an exposure twice as long as the one directly preceding it. For example, at $^1/_{100}$ second, twice as much light reaches the film as at $^1/_{200}$.

Now, if you give twice the exposure time—for example, $^1/_{50}$ of a second instead of $^1/_{100}$—the use of the next smaller lens opening will permit the same amount of light to reach the film: $^1/_{50}$ of a second at f/11 admits the same amount of light as $^1/_{100}$ at f/8.

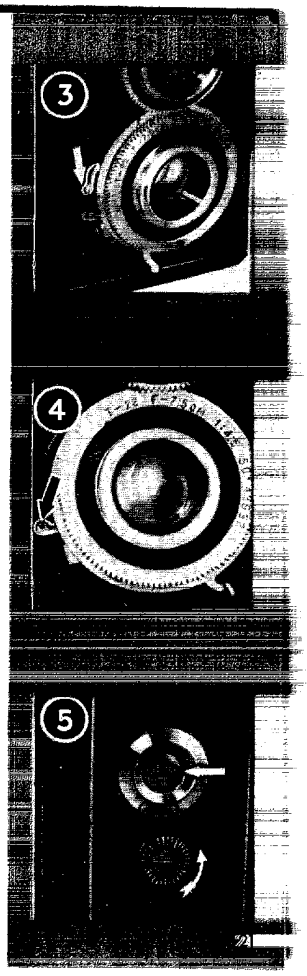
The figures engraved on the shutter and lens opening scales show only fraction denominators; for example, 50 instead of $^1/_{50}$, 4.5 instead of f/4.5, etc.



Camera loading with standard roll film may be performed in daylight. Follow these steps for easy loading:

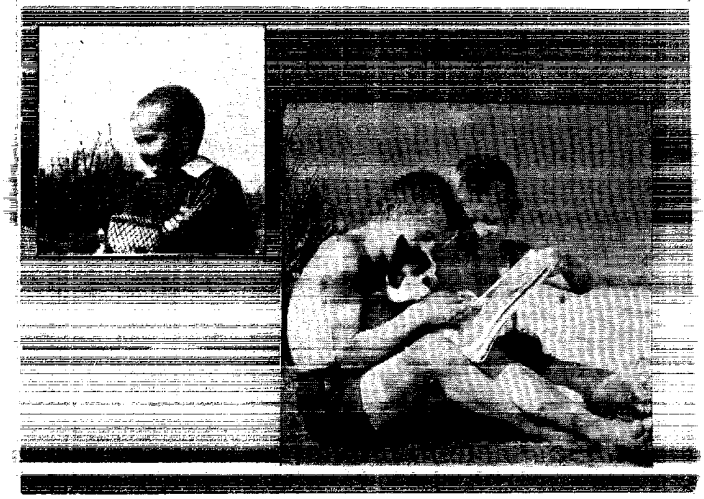
1. Raise both locking springs 1 (Fig. 5) and open the camera back.
2. Break the seal on the roll of film, insert the end of the film protective paper into the slit of the take-up spool 3 and fold it. Turn the film winding knob 4 until two or three layers of paper are wound on the spool.
3. After checking proper tension of the paper, insert the film spool into the lower film compartment, replace the camera back, making sure it is securely closed and locked.
4. Turn the film window cover knob 6 counter-clockwise and open the window cover. Then, slowly turn the winding knob until the first signalling marks and later the figure "1" appear on the film protective paper in the red film window 5. Close the film window cover.

The camera is now ready for operation.

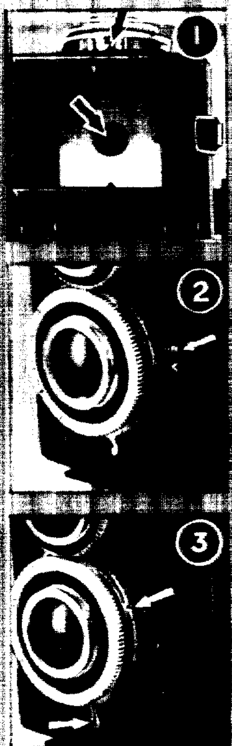


3. Adjust the shutter, according to the type of subject, by turning the exposure setting lever 8 until index line is opposite speed desired. Press down the shutter winding lever 11.
4. Make the exposure by slowly pressing the shutter release lever 10. Take care not to move the camera during the exposure, or the picture may be blurred.
5. Open the film window cover by turning the cover knob 14 (Fig. 3). Slowly turn the winding knob 1 (Fig. 2) until the next exposure number appears in the red film window. Close the window cover, and you are ready for the next picture. Get into the habit of advancing the film immediately after taking each picture.

4. Remove the spool with the exposed film, seal the end of the protective paper and have the film developed as soon as possible. Do not allow the film to unwind from the spool, or it will be fogged.
5. Move the lower empty spool into the upper film compartment, care being taken to have the slotted end of the spool directed towards the winding knob.
6. Replace the spool holder and turning the film winding knob clockwise make sure the spool is rotating.



Taking the Picture



To take the picture, hold the camera and compose the subject on the ground glass as you want it to appear in the finished picture. A lower or higher position may be desirable to get just the effect you want. When using the frame view-finder hold the camera at eye-level, so that the edges of both rear and front hood panel openings coincide.

Follow these steps:

1. Focus by turning the knurled lens mount until the ground glass image is sharp, or by estimating the distance and setting this figure on the distance scale.
2. Adjust lens opening, according to the light condition, by moving lens opening lever 7 (Fig. 2) across the scale.

Camera Loading

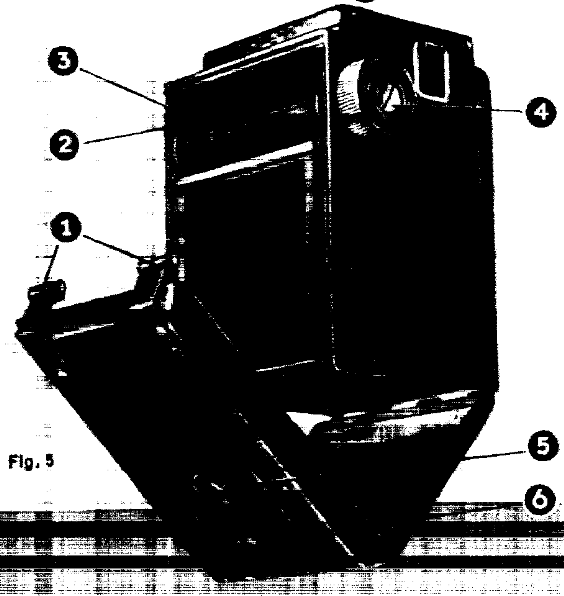


Fig. 5

1—Camera back locking springs; 2—Spool holder tang; 3—Take-up spool; 4—Film winding knob 5—Film window; 6—Film window cover knob.

Camera Set

Fig. 6

Complete camera set (Fig. 6) includes:
"T-22" type lens,
camera take-up spool,
lens cap,
[illegible]
[illegible]
Instruction manual and certificate of inspection.

Camera Unloading

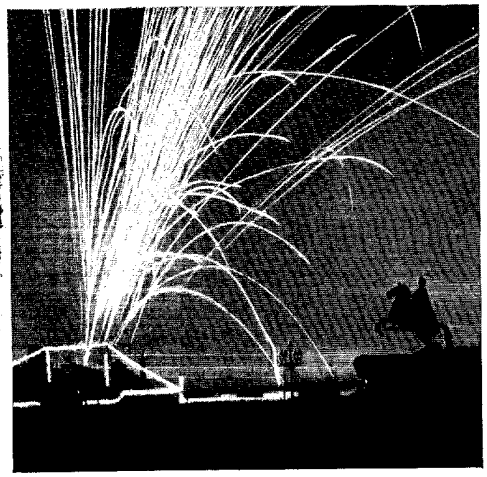
After the twelfth (last) exposure has been made, the film protective paper should be completely winded. Turning of the knob is sometimes interfered with when the winding is almost completed; however, this should not prevent unloading the camera in daylight.

To unload the camera follow these steps:

1. Open the camera back.
2. Pull out the film winding knob 4 (Fig. 5) and turn it slightly to secure it in the out position.
3. Swing the spool holder out of the camera body by turning the holder tang 2 (Fig 5) towards you.

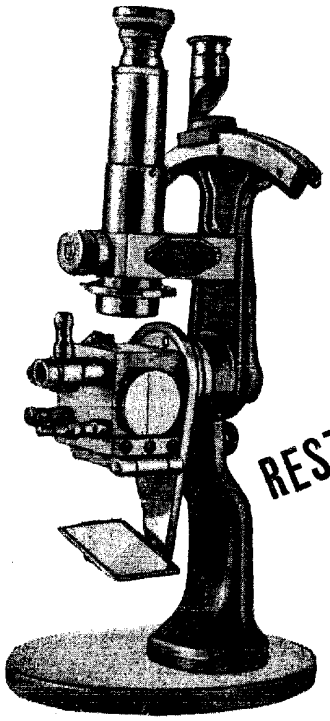
Contents

Order No. 2247 Vneshtorgizdat



MOSCOW - U. S. S. R.

VSESOJUZNOJE
EXPORTNO-IMPORTNOJE
OBJEDINENIJE
"STANKOIMPORT"



RESTRICTED

REFRACTOMETERS

U S S R MOSCOW

REFRACTOMETERS

Refractometers are used for measuring the refractive index (bending power of the material for a ray of light incident on its surface) and the colour dispersion of liquid and solid substances.

The refractive index is an important characteristic property of a substance, as are, for example, the boiling and freezing points, the density and the rotation of the polarization plane.

The value of the refractive index of a solution is related to the quantity of solute, i.e. to the concentration of the solution and to its temperature. At a given temperature the refractive index rises with the concentration of the solution.

In many instances the measurement of refractive index and dispersion is sufficient for estimation of the quality and concentration of substances and may be used in place of chemical analyses requiring considerably more operation time.

Refractometer estimations, with a little practice, take only a few minutes and require small quantities of the substance (1—2 drops); they are therefore especially suitable for routine analyses and mass identifications.

For many solutions there are charts giving the refractive index or the dispersion factor. Refractometer readings allow with the aid of these charts to estimate the concentration of a solution or to evaluate the degree of its purity.

The refractometers manufactured in the USSR are of high quality and precision.

UNIVERSAL REFRACTOMETER „PЛУ"

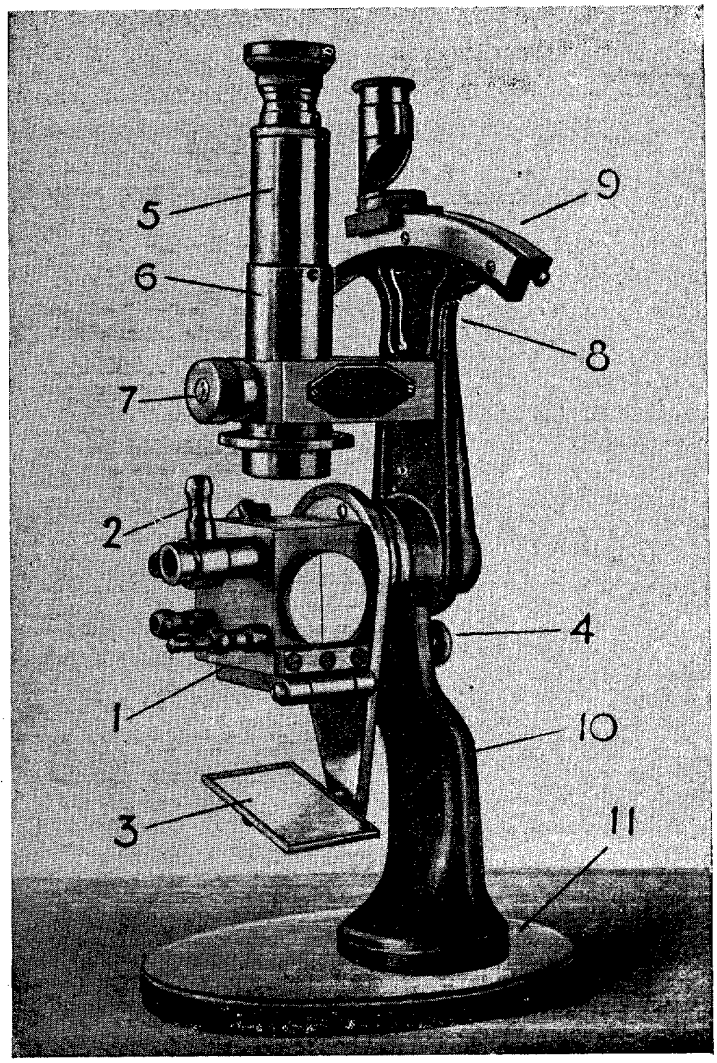


FIG. 1. Universal Refractometer Model „PJIУ"

ILLUMINATION

Either daylight or a 75-100-watt electric bulb may be used for illumination.

A beam of light reflected by the mirror is directed through the opening on the illuminating or measuring prism. If the instrument is conveniently placed in relation to the light source the use of mirror may be unnecessary.

SPECIFICATIONS

Range of refractive indices — from nd = 1.3 to nd = 1.7
Reading accuracy — 0.001
Overall dimensions — length — 248 mm; width — 150 mm; height — 323 mm.
Weight of instrument — 4.7 kg.

STANDARD EQUIPMENT

Thermometer
Operating instructions
Certificate
Carrying case.

The PJIУ Universal Refractometer is based on the refractometric principle, i.e. on the measurement of the refractive index of a solution. The method of measurement depends upon the observation of the critical angle for total reflection between glass of high refractive index and the substance to be examined.

This instrument is used in many branches of the food and other industries where ease and rapidity of analysis are essential, with the use of only small quantities (1—2 drops) of the substance.

The instrument (Fig. 1) consists essentially of the following parts: prism box, telescope and upright with base.

Prism box (1) consists of two hinged halves and may be rotated about an horizontal axis by means of a lever and rack and pinion mechanism. The box has two fittings connected by a rubber tube through which water is circulated to maintain the temperature of the prisms at 20°C. For oil testing, the water temperature range is 25°-40°C. A thermometer is screwed into the threaded adapter (2). The box is provided with openings for directing light by means of mirror (3) attached to a swinging arm. The arm may be adjusted by means of screw (4).

Telescope (5) is used for observing the border line between the bright and dark portions of the field. Screw (6) on the observing telescope is used for zero setting and handwheel (7) for dispersion correction.

The telescope is rigidly attached to sector (8) which carries the refractive index scale (9).

The scale reading eyepiece lever is rigidly attached to the prism box.

Prism box together with telescope, sector and lever may be turned so that the prism is horizontal when the sample is being placed.

The instrument is mounted on upright (10) attached to base (11)

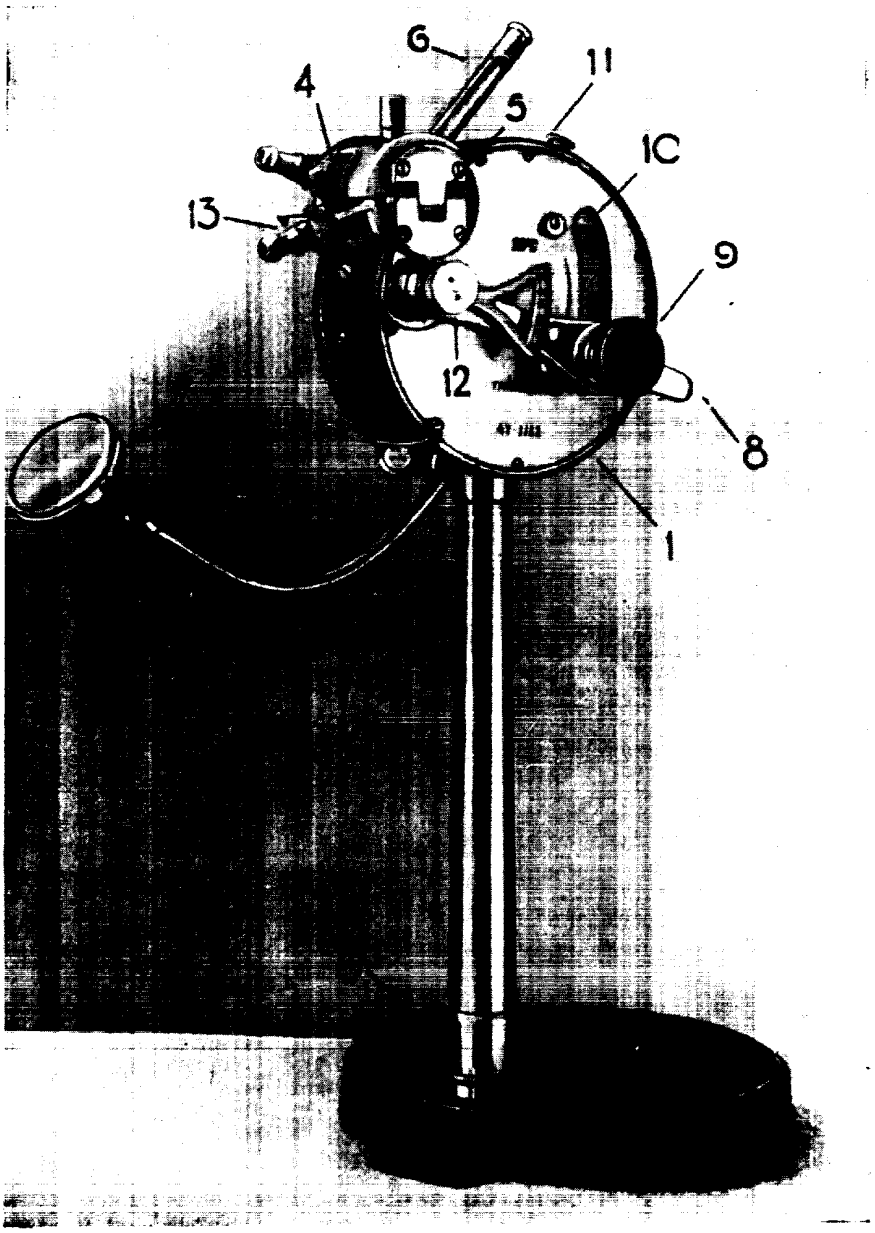


FIG. 2. Laboratory Refractometer Model „P.T"

LABORATORY REFRACTOMETER „PA"

The PJI Laboratory Refractometer is based on the refractometric principle, i.e. on the measurement of the refractive index of a solution. The method of measurement depends upon the observation of the critical angle for total reflection between glass of high refractive index and the substance to be examined.

This instrument is intended mainly for laboratory control of food products (sugar, oils, fats, margarine) and for the estimation of the percentage of dry substances in solutions on the basis of sucrose.

The instrument (Fig. 2). consists of the following essential parts : circular casing (1), supported on upright (2), base (3), prism box (4) attached to casing and consisting of two halves connected by means of hinge (5).

The box has two fittings connected by a rubber tube through which water is circulated to maintain the temperature of the prisms at 20°C. For oil testing the water temperature range is 25°—40°C.

The instrument is supplied with a thermometer (6). The box is provided with apertures for directing light by means of mirror (7).

Handle (8) is used for moving the eyepiece (9) along the scale (10).

The apertures in the upper half of box (4), into which light is directed when transparent liquids are tested, are closed by means of a shield. There is also a shield (13) in the lower half of the prism box into which light is directed when dark coloured liquids are under examination.

Plug (11) on the instrument casing is used for closing the aperture for zero setting.

Compensator head (12) renders the line of separation colourless.

Fig 3 shows path of light through the refractometer.

All optical parts are made of high quality optical glass.

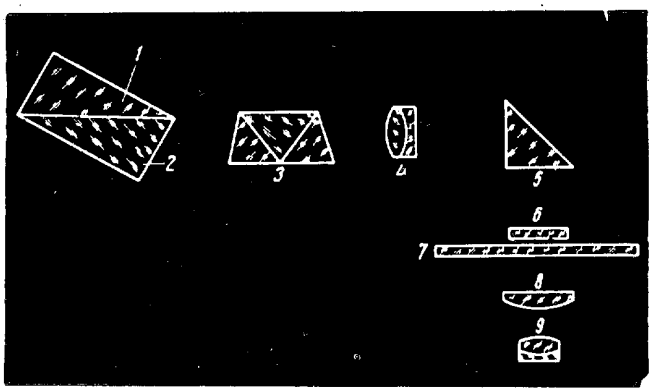


FIG. 3. Path of light through Laboratory Refractometer

1,2 — Abbe prisms; 3 — Compensator ; 6 — Scale reticle; 7 — Scale ; 4, 5, 8, and 9 — Parts of observing telescope.

TEMPERATURE CONTROL

Measurements are made at a temperature of 20°C to be obtained by passing water through the box.

If measurements are made at a different temperature within the range of 10° to 30°C, it is necessary to use the temperature correction table supplied with the Instrument.

SPECIFICATIONS

Range of refractive indices — from nd = 1.3 to nd = 1.54.
Percentage range of dry substances in solution, in terms of sucrose — from O to 95%.

Accuracy of reading: a) by refractive index scale — 0.001. By using the dry substance scale and conversion charts it is possible to increase reading accuracy up to 0.0002—0.0004.

b) by dry substance scale (sucrose) — 0.2% for solution concentrations ranging from O to 50%, and — 0.1% for concentrations ranging from 50% and higher.

Light source — daylight or 75—100-watt electric bulb.

Overall dimensions — length — 178 mm; width — 218 mm; height — 414 mm.

Weight of instrument — 6.3 kg.

STANDARD EQUIPMENT

Thermometer
Certificate
Key for zero setting of scale
Carrying case.

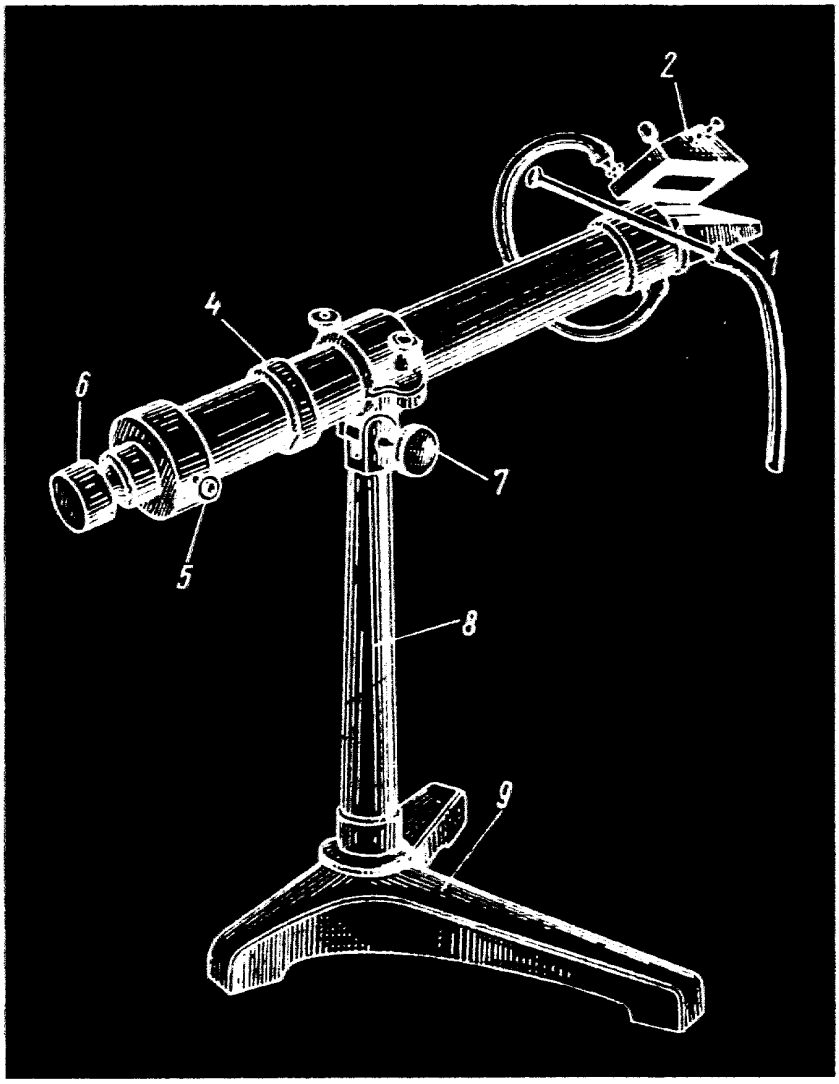


FIG. 4. Precision Refractometer Model „РПЛ"

PRECISION REFRACTOMETER „PΠΛ"

In laboratory work it is often necessary to cary out analyses in the range from O to 30%, the reading accuracy required being considerably higher. In order to meet this demand the PΠJI Precision Refractometer has been developed with a dry substance scale range from O to 30% and an accuracy to 0.05%.

In the case of more concentrated solutions these must be correspondingly diluted.

The instrument (Fig. 4) consists of a long cylindrical tube hinged approximately in the centre on a column attached to a cast iron base. On one end of this tube are two hinged water-jacketed mounts with Abee prisms. The lower mount carries the measuring prism (1) while the upper one carries the illuminating prism (2) with the shield (3).

Water may be circulated through the prism mounts to obtain a temperature of 20°C, which is to be measured by a thermometer arranged in the lower prism mount. On the other end of the tube is a rotatable external ring of the compensator (4), index drum (5) and observing eyepiece with diaphragm (6).

The Precision Refractometer differs from the usual type refractometer in that the distance between the Abbe prisms and the scale is considerably longer; the scale divisions are thus enlarged, and it is possible to use a vernier, which ensures a higher accuracy and at the same time reduces the dry substance scale range (from O to 30%). In view of this, more concentrated solutions must be suitably diluted for analysing.

The scale and drum readings are converted by the use of a chart supplied with the instrument, into dry substance contents, in terms of sucrose.

The Precision Refractometer may be used in a dark or in a light room, with, as a source of light, either daylight or a 100-watt electric bulb, placed in a housing with 13 × 13 cm. ground glass.

SPECIFICATIONS

Measuring range — from O to 30% dry substance
Reading accuracy — 0.05%
Length of instrument — 405 mm
Base diameter — 180 mm
Weight of instrument — 6 kg

STANDARD EQUIPMENT

Thermometer
Certificate
Operating instructions
Carrying case

„Stankoimport"

Machine Tools.
Metai Working Machinery.
Woodworking Machinery.
Measuring Instruments and Apparatus.
Testing Machines and Instruments.
Optical Instruments and Equipment.
Portable Electric and Pneumatic Tools.
Metal and Wood Cutting Tools.
Mechanic's Tools and Chucks.
Carbide Products.
Abrasive Products.
Ball and Roller Bearings.
Metallographic, Biological and Medical Microscopes
Motion Picture Equipment and Accessories.
Geodetic Instruments and Equipment.
Photo-Equipment, Binoculars, Magnifiers, Lenses, etc.

* * *

All enquiries and correspondence to be forwarded to:
Moscow 168, ul. Kuibysheva, 21
Vsesojuznoje Exportno-Importnoje Objedinenije
„STANKOIMPORT"

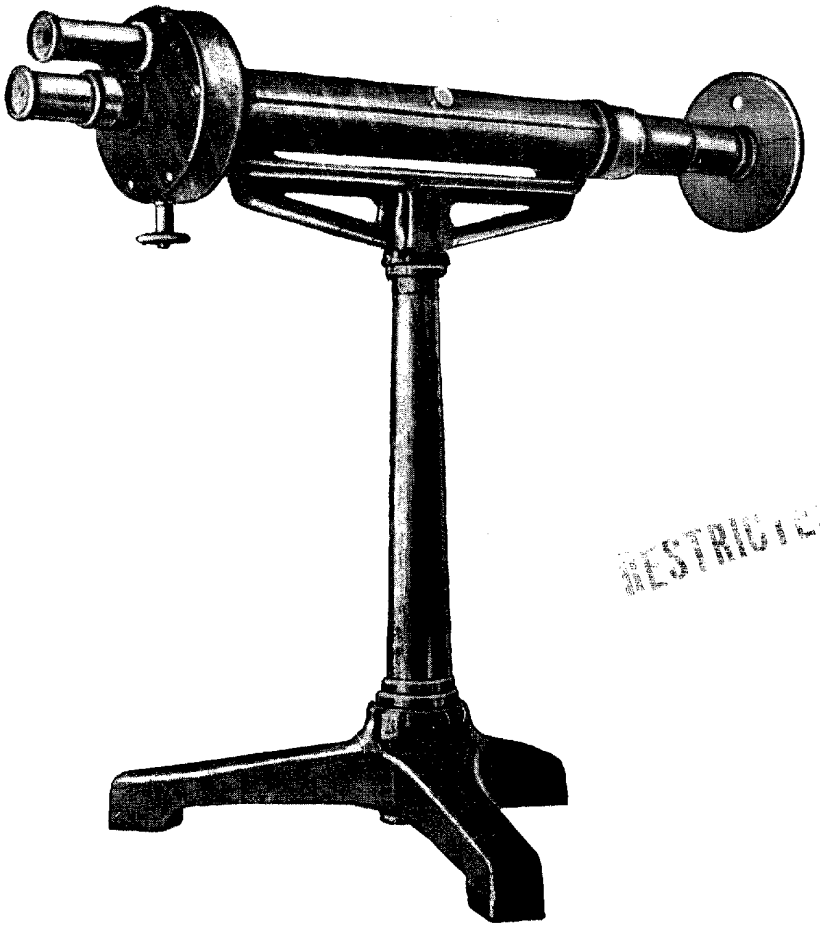
For cables: Stankoimport Moscow
Phone: K 5-54-84.

* * *

Desing and Specifications
of instruments
Listed herein are subject
to change
without notice.

Approved For Release 2004/04/15 : CIA-RDP83-00415R011800090004-7

VSESOJUZNOJE EXPORTNO-IMPORTNOJE OBJEDINENIJE „STANKOIMPORT"



MOSCOW
U S S R

SACCHARIMETERS

SACCHARIMETERS

The polarization method is often made use of for analysing certain substances such as sugar, oils, fats, alkaloids, etc.

For research work, a polarimeter with a scale graduated in angular degrees may be used. However, owing to the necessity of using a monochromatic source of light and to the incovenience of converting the polarimeter readings for the determination of concentrations, the polarimeter has not found wide application in the industry. With the advent of saccharimeters, the polarization method has found widespread use, particularly in the sugar industry, due to its extremely easy and accurate estimation of sugar contents in substances or solutions. The saccharimeter is suitable for the estimation not only of sugar, but of nearly all polarizing substances, with the exception of some essential oils.

Saccharimeters are used for direct-reading mass investigation of substances, as the time required for each measurement is reduced to a minimum.

The saccharimeters made in the USSR are of high quality and precision.

SINGLE QUARTZ WEDGE COMPENSATION SACCHARIMETER Model COK-1

The COK-1 Single Quartz Wedge Compensation Saccharimeter is a half-shadow polarimeter. It is based on the polarization method, i. e. on the property of optically active substances to rotate the polarization plane. This rotation is compensated by means of quartz wedges.

The instrument is used mainly in the sugar industry for the estimation of sucrose percentage in solutions.

It can also be used for the estimation of other optically active substances rotating the polarization plane to the right or to the left.

The saccharimeter reads directly in the Ventzke scale, 100° on this scale corresponding to 35.65 polarimeter angular degrees.

The scale is calibrated so as to read 100° Ventzke when polarizing in an observation tube 200 mm long a solution containing in 100 cm^3 26.026 grams of chemically pure dry sucrose. All weighings to be made in air with brass weights, the completion of the volume and the polarization are to be made at 20°C.

The instrument (Fig. 1) consists of the following essential parts: polarizer unit (8) mounted on the bracket away from the observation end; analyser unit (11) mounted on the observation head.

Trough (9) accomodating the observation tubes is supported on bracket (7) connecting the polarizer unit with the observation head. The trough accommodates tubes 400 mm, 200 mm, and 100 mm long.

The observation head has an observing eyepiece (2), scale reading eyepiece (1) and a sleeve (3) to be removed for colour matching. Vernier unit (10) is located at the back of the observation head. Milled head (4) located at the lower observation head end provides for moving the quartz wedge and scale by means of a rack and pinion.

The saccharimeter is mounted on a pillar stand (6) attached to a cast iron base.

The scale, vernier and all optical parts are effectively protected, so as to prevent mechanical damage and accumulation of dirt.

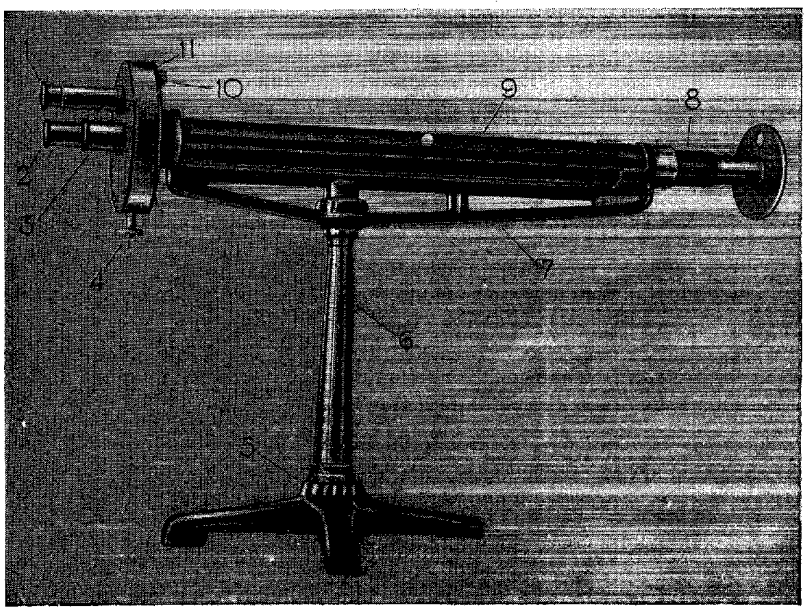


FIG. 1. Saccharimeter Model COK-1

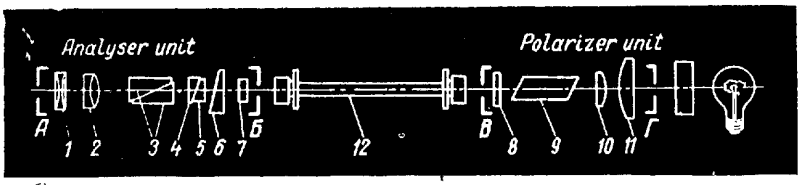


FIG. 2 Path of light through Saccharimeter COK-1.

Analyser unit: Fig. 2. shows path of light through the instrument A, B, — Diaphragms; 1 — Observing eyepiece movable lens; 2 — Eyepiece stationary lens; 3 — Analyser; 4 — Stationary quartz wedge; 5 — Glass counterwedge; 6 — Movable quartz wedge; 7 — Cover glass.

Polarizer unit: B, Г — Diaphragms; 8 — Cover glass; 9 — Polarizer; 10 — Illuminating lens; 11 — Condensing lens; 12 — Observation tube with solution; 13 — Light filter of tube with solution.

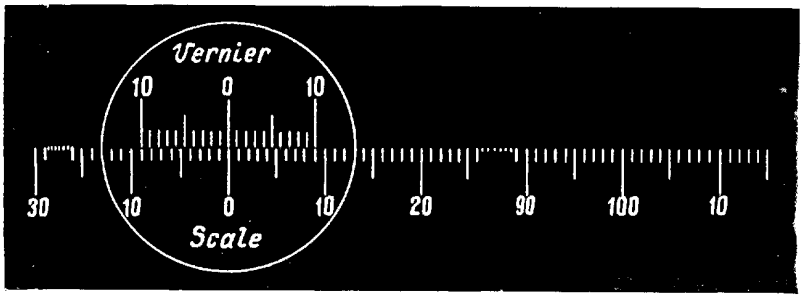


FIG. 3 Scale and vernier of Saccharimeter COK-1.

Fig. 3 shows scale and vernier as seen through the scale reading eyepiece. Vernier readings up to 0.1 scale division, i. e. up to 0.1° Ventzke are available. The scale and vernier are engraved on glass plates. Glass scales are more convenient to read and less sensitive to temperature variations than metal scales.

POLARIZER AND ANALYSER

The polarizer splits the incident ray of light in two polarized rays and allows to pass only the one whose plane of vibration coincides with the polarization plane.

The analyser detects the displacement of the polarization plane due to the introduction of the solution into the optical system of the saccharimeter.

The polarizer and analyser prisms are made of high quality iceland spar.

COMPENSATION DEVICE

The compensation device consists of quartz wedges made of special grade high quality optical quartz.

The saccharimeter allows the use of a white light source since the dispersion caused by the sucrose is almost fully compensated by the levorotatory quartz wedge.

LIGHT SOURCE

Illumination is provided by means of a 100-watt bulb placed in a lamp house fitted with a ground glass plate.

The light filter should be used whenever possible especially, when analysing solutions having over 40% contents. The light filter is a bi-chromate solution that fills a special tube placed between the lamp house ground glass and the instrument condensing lens.

The saccharimeter COK-1 is provided with a tube 30 mm long to be filled with bi-chromate solution as a light filter.

SPECIFICATIONS

Measuring range — from — 20° to +100° Ventzke ("+" indicating dextrorotation of polarization plane, and "—" levorotation of polarization plane).

Scale reading accuracy with vernier — 0.1° Ventzke.

Instrument sensitivity — 0.05° Ventzke.

Length of observation tubes — 100 mm, 200 mm, and 400 m.

Overall dimensions — length — 770 mm; width — 338 mm; height — 442 mm.

Weight of instrument — 12 kg.

STANDARD EQUIPMENT

Observation tubes 400 mm, 200 mm, and 100 mm long (3 tubes)

Key for zero setting.

Screen for positioning of instrument in relation to light source.

Certificate.

Description of instrument and operating instructions.

Carrying case.

SACCHARIMETER

SINGLE QUARTZ WEDGE COMPENSATION SELECTIVE TYPE

Model COKC-1

The COKC-1 Single Quartz Wedge Compensation Selective Saccharimeter is a half-shadow polarimeter. It is based on the polarization method.

The rotation of the polarization plane is compensated by means of quartz wedges.

The COKC-1 Saccharimeter, in comparison with that of COK-1, has a scale covering a smaller range and is intended mainly for investigation of solutions of lower concentration.

The Ventzke scale is used in this instrument.

The scale is calibrated so as to read 100° when polarizing in an observation tube 200 mm long a solution containing in 100 cm³ 26.026 grams of chemically pure dry sucrose. Weighings to be made in ar with brass weights, the completion of the volume and the polarization are to be made at 20°C.

The selective saccharimeter is arranged for use with observation tubes up to 200 mm long.

The instrument (Fig. 4) consists of the following essential parts:

1 — Scale reading eyepiece; 2 — Observing eyepiece; 3 — Sleeve, to be removed for colour matching; 4 — Milled head for moving quartz wedge and scale by means of rack and pinion; 5 — Closed seat of screw for adjusting the vernier; 6 — Trough with cover for accommodation of observation tubes; 7 — Screw for fixing polarizer sleeve.

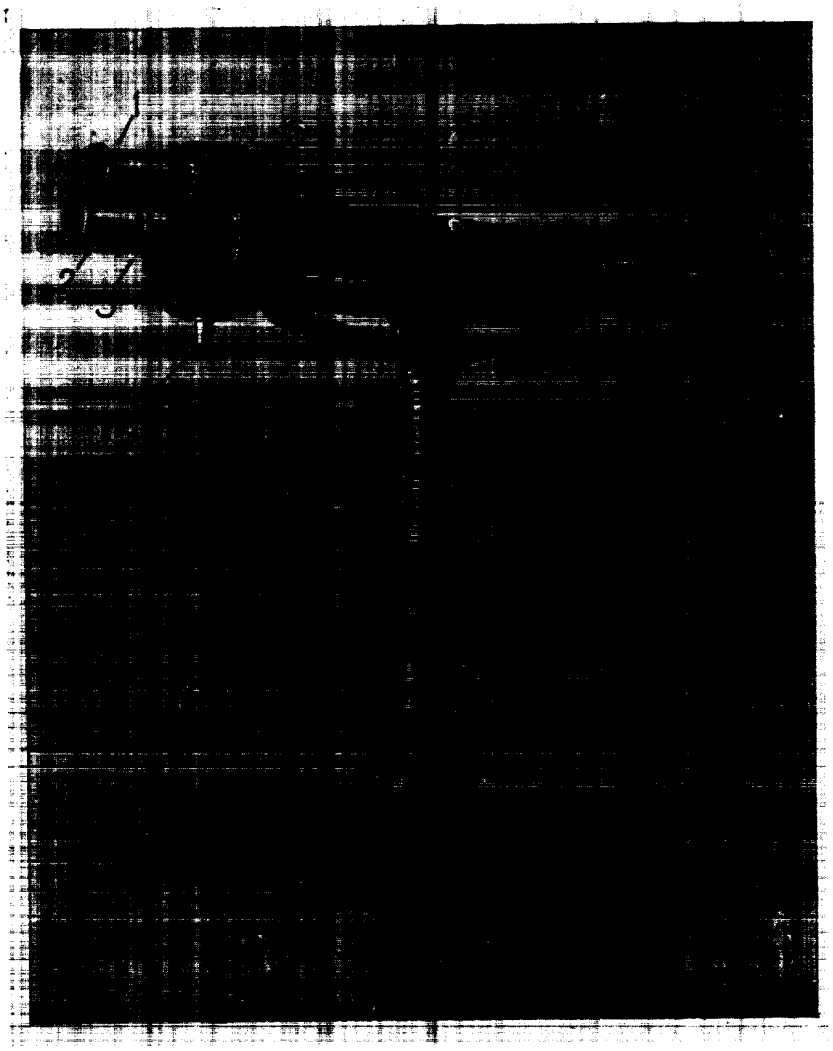


FIG. 4. Saccharimeter Model COKC-1

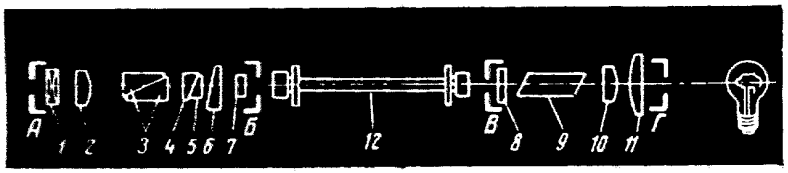


FIG. 5. Path of light through Saccharimeter COKC-1

Analyser unit: А, Б — Diaphragms; 1 — Observing eyepiece movable lens; 2 — Eyepiece stationary lens; 3 — Analyser; 4 — Stationary quartz wedge; 5 — Glass counterwedge; 6 — Movable quartz wedge; 7 — Cover glass.

Polarizer unit: В, Г — Diaphragms; 8 — Cover glass; 9 — Polarizer; 10 — Illuminating lens; 11 — Condensing lens; 12 — Observation tube with solution.

POLARIZER AND ANALYSER

The polarizer splits the incident ray of light in two polarized rays and allows to pass only the one whose plane of vibration coincides with the polarization plane.

The analyser detects the displacement of the polarization plane due to the introduction of the solution into the optical system of the saccharimeter.

The polarizer and analyser prisms are made of high quality iceland spar.

COMPENSATION DEVICE

The compensation device consists of quartz wedges made of special grade high quality optical quartz.

The saccharimeter allows the use of a white light source since the dispersion caused by the sucrose is almost fully compensated by the levorotatory quartz wedge.

SCALE AND VERNIER

By means of a vernier estimations are possible up to 0.1 scale division, i. e. up to 0.1° Ventzke. The scale and vernier are engraved on glass plates. Glass scales are more convenient to read and less sensitive to temperature variations than metal scales.

LIGHT SOURCE

Illumination is provided by means of a 100-watt bulb placed in a lamp house fitted with a ground glass plate.

SPECIFICATIONS

Measuring range — from 0° to 50° Ventzke.
Scale reading accuracy with vernier — 0.1° Ventzke.
Instrument sensitivity — 0.05° Ventzke.
Length of observation tubes — 100 mm and 200 mm.
Overall dimensions — length — 480 mm; width — 305 mm; height — 401 mm.
Weight of instrument — 8.8 kg.

STANDARD EQUIPMENT

Observation tubes — 200 mm and 100 mm long (2 tubes).
Key for zero setting.
Screen for positioning of instrument in relation to light source.
Certificate.
Description of instrument and operating instructions.
Carrying case.

SACCHARIMETER EQUIPMENT

Supplied at Extra Cost

Observation Tubes

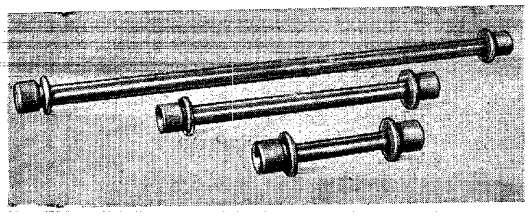


FIG. 6. Set of observation tubes

The saccharimeter observation tube is made of exact length and is filled with a transparent, preferably slightly coloured solution of the substance under investigation.

The observation tubes (Fig. 6) are made of glass and furnished in three lengths: 100 mm, 200 mm and 400 mm.

The tubes have cover glasses which are tightened at both ends of the tubes by means of screw caps with a rubber ring between the cover glass and the cap.

Each tube is prepared with the greatest care and accuracy and is furnished with 2 cover glasses and 2 rubber rings.

GLUCOSIMETER

Model ПГ

The ПГ Glucosimeter is a half-shadow single quartz wedge compensation polarimeter used for the estimation of the percentage content of glucose in solutions.

The Glucosimeter, as all other types of polarimeter-saccharimeters, is based on the polarization method.

The instrument differs from usual polarimeter-saccharimeters in that it is provided with a special scale graduated directly in terms of dry glucose percentage content of solutions or other substances.

The Glucosimeter scale is based on a normal weight of 32.8 grams of chemically pure dry glucose (weighed in air by means of a brass weight) dissolved in distilled water and made up to 100 cm^3 at 20°C, and read in a 200 mm tube at the same temperature.

The determination of glucose content in solutions (glucose is sometimes called dextrose, diabetic sugar, starch sugar and grape sugar) is used mainly for medical purposes.

The instrument (Fig. 7.) consists of the following essential parts: polarizer unit (8) mounted on the bracket away from the observation end; analyser unit (5) mounted on the observation head.

Trough (7) accomodating the observation tubes is supported on bracket (9) connecting the polarizer unit with the observation head. The trough accomodates tubes 100 mm and 200 mm long.

The observation head has an observing eyepiece (2), a sleeve (3) to be removed for colour matching, and a scale reading eyepiece (1).

The vernier unit (6) (for zero setting) is located at the back of the observation head. Milled head (4) located at the lower observation head end provides for moving the quartz wedge and scale by means of a rack and pinion.

The Glucosimeter is mounted on a pillar stand (10) attached to a cast iron base (11).

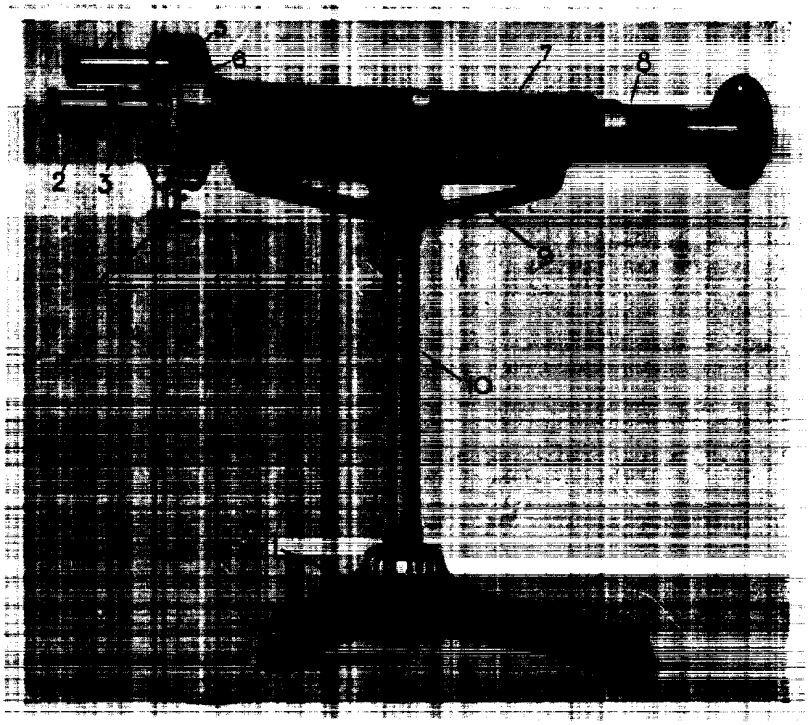


FIG. 7. Glucosimeter Model „ПГ"

POLARIZER AND ANALYSER

The polarizer splits the incident ray of light in two polarized rays and allows to pass only the one whose plane of vibration coincides with the polarization plane.

The analyser detects the displacement of the polarization plane due to the introduction of the solution into the optical system of the instrument.

The polarizer and analyser are made of high quality iceland spar.

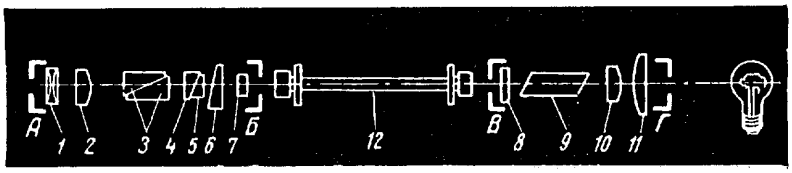


FIG. 8. Path of light through Glucosimeter ПГ

Analyser unit: А, Б — Diaphragms; 1 — Observing telescope movable eyepiece; 2 — Observing telescope objective; 3 — Analyser; 4 — Stationary quartz wedge; 5 — Glass counter-wedge; 6 — Movable quartz wedge; 7 — Cover glass.

Polarizer unit: В, Г — Diaphragms; 8 — Cover glass; 9 — Polarizer; 10, 11 — Condensing lenses; 12 — Observation tube.

COMPENSATION DEVICE

The compensation device consists of quartz wedges made of special grade high quality optical quartz.

SCALE AND VERNIER

Fig. 9 shows scale and vernier as seen through the scale reading eyepiece. Vernier readings up to 0.1 scale division, i. e. up to 0.1% are available.

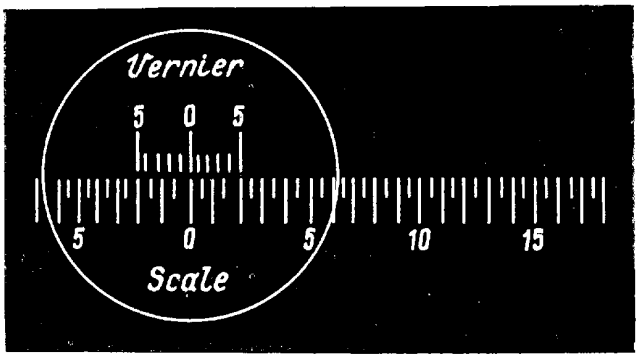


FIG. 9. Scale and vernier of Glucosimeter ПГ

LIGHT SOURCE

Illumination is provided by means of a 100-watt bulb placed in a lamp house fitted with a ground glass plate.

SPECIFICATIONS

Measuring range — from 0 to 15% of glucose (based on normal weight)
Scale reading accuracy with vernier — 0.1%.
Length of observation tubes — 100 mm and 200 mm
Overall dimensions — length — 480 mm; width — 305 mm; height — 401 mm.
Weight of instrument — 8.8 kg.

STANDARD EQUIPMENT

Observation tubes 200 mm and 100 mm long (2 tubes).
Key for zero setting.
Screen for positioning of instrument in relation to light source
Certificate.
Description of instrument and operating instructions.
Carrying case

SACCHARIMETER EQUIPMENT

Supplied at Extra Cost

Control Tubes with Quartz Plates

FIG. 10. Set of control tubes

Control tubes (Fig. 10) with quartz plates are used for checking the saccharimeter scale readings. Those points of scale for which plates are furnished are to be checked.

Single quartz wedge compensation saccharimeters are to be checked at least at five points in addition to the zero point.

Checking at intermediate points is carried out as follows: the control scale is set, for example, at 12°; when polarizing at this setting the instrument scale should also read 12°. Similarly, by moving further the control scale through every 5—10°, the whole scale from 0° to 100° may be thus checked.

For scale control of the saccharimeter by means of a control tube:

1. Set observation scale at zero.
2. Place control tube in trough, with plate nearer to analyser.
3. When polarizing, the scale reading should coincide to 0.1° with the number of degrees indicated on the tube.

Control tubes are furnished in sets of five for the following points: 25°, 40°, 55°, 75°, and 100°.

The tubes are supplied in cases lined with cloth.

Vsesojuznoje Objedinenije

exports and imports.

Machine Tools.
Metal Working Machinery.
Woodworking Machinery.
Measuring Instruments and Apparatus.
Testing Machines and Instruments.
Optical Instruments and Equipment.
Portable Electric and Pneumatic Tools.
Metal and Wood Cutting Tools.
Mechanic's Tools and Chucks.
Carbide Products.
Abrasive Products.
Ball and Roller Bearings.
Metallographic Biological and Medical Microscopes
Motion Picture Equipment and Accessories
Geodetic Instruments and Equipment.
Photo-Equipment. Binoculars, Magnifiers. Lenses, etc.

* * *

All enquiries and correspondence to be forwarded to:
Moscow 168, ul. Kuibysheva, 21
Vsesojuznoje Exportno-Importnoje Objedinenije
„STANKOIMPORT"

For cables: Stankoimport Moscow
Phone: K 5-54-84.

* * *

Design and specifications of instruments listed here in are subject to change without notice.

Approved For Release 2004/04/15 : CIA-RDP83-00415R011800090004-7

This Instruction Manual was prepared to help you make good pictures.

Your pictures will be better pictures right from the start, if you spend a few minutes to get acquainted with your camera. This manual gives you quickly and simply the essentials of camera operation.

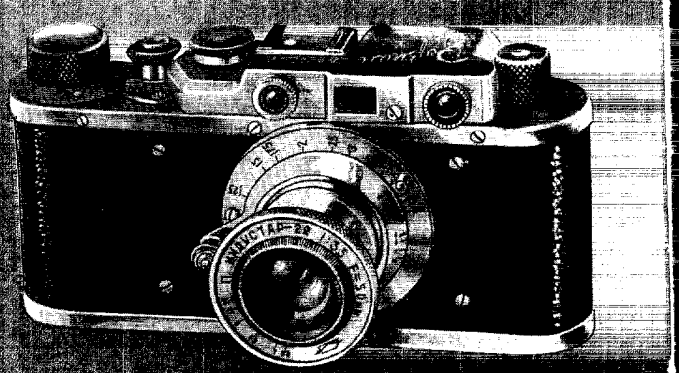
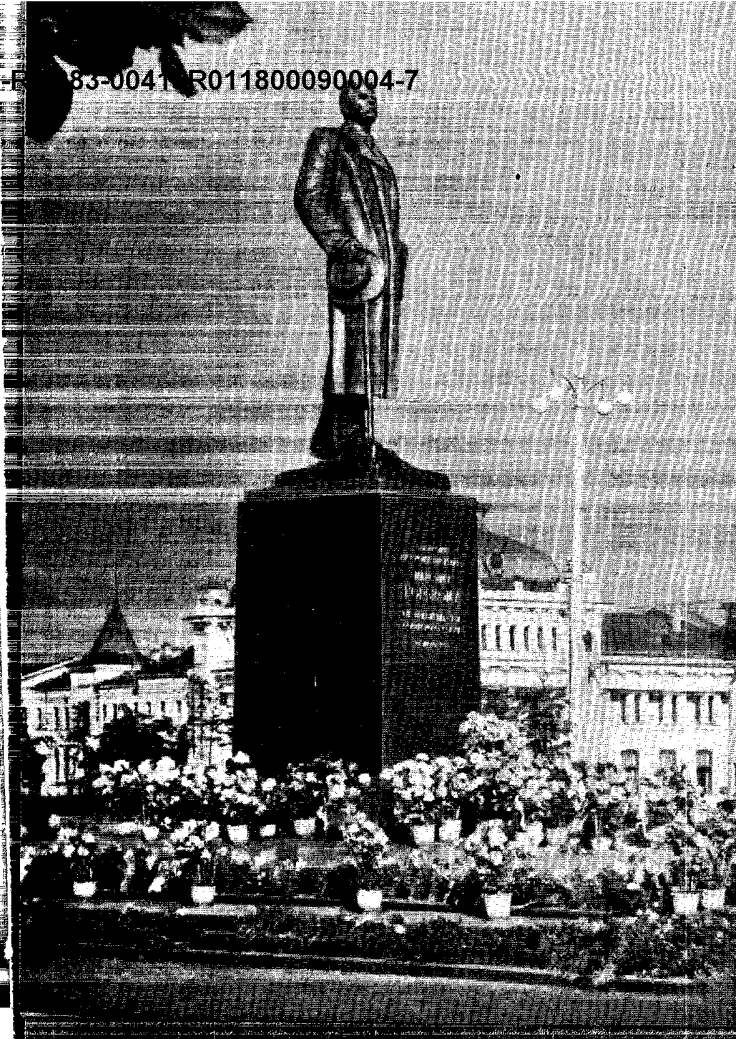
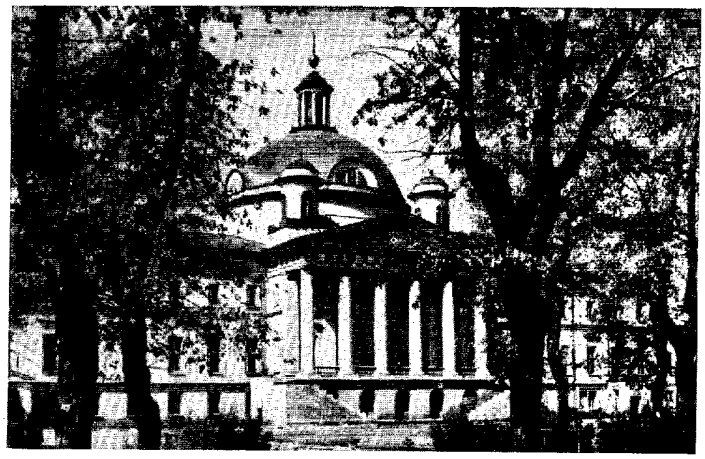


Fig. 1





„ZORKI camera

„ZORKI"

Instruction manual

„Mashkoimport"

Moscow · USSR

ZORKI FEATURES

The "Zorki" (Fig. 1) is a modern and perfect 35 mm miniature camera primarily designed for amateur photographers and photo-journalists.

It uses a standard perforated 35 mm motion picture film in length of about 1.6 m which is sufficient to make up to 36 double frame exposures, 24×36 mm in size.

The camera is equipped with a curtain shutter and shutter speed dial for setting speeds from $^1/_{30}$th to $^1/_{500}$th of a second and bulb (Z) exposure.

The shutter is coupled with the film advancing mechanism so that the winding of the shutter automatically transports the film after each exposure; thus intervals between separate snapshots are greatly reduced and accidental double exposures are completely eliminated.

The automatic film counter indicates the number of exposures taken.

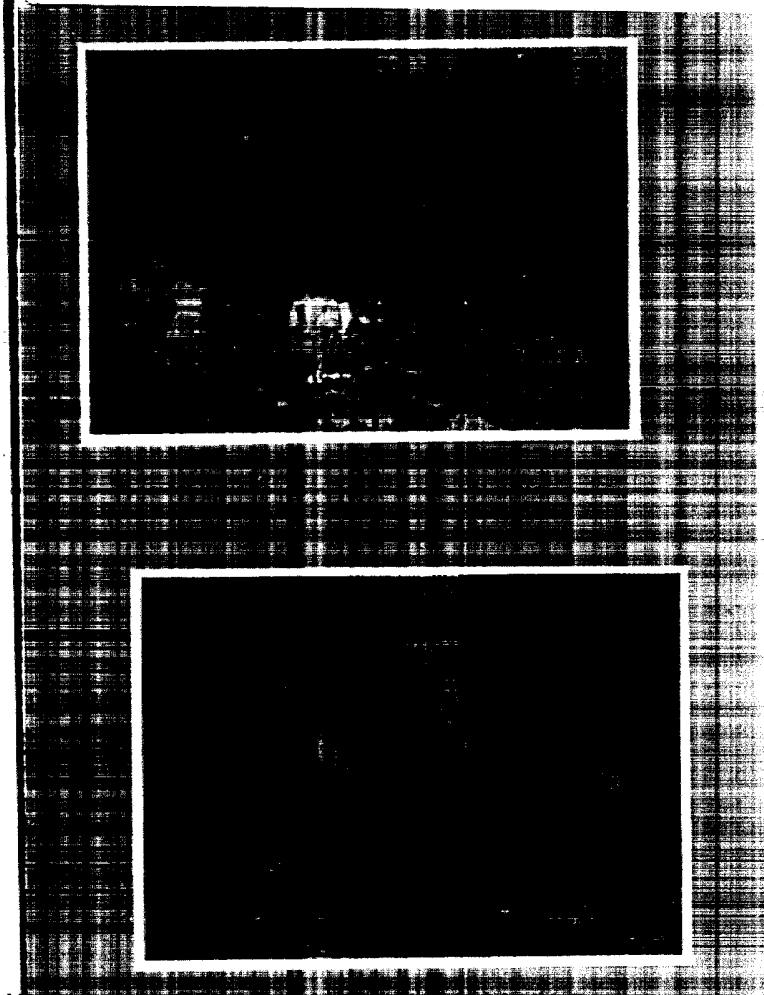
The camera is fitted with an optical view-finder and with an optical range-finder coupled to the lens focusing mechanism. Focusing is done by bringing together two images of the same object viewed in the range-finder field of view.

The "Zorki" is of small size and light weight, and the proportions of the body have been nicely designed for perfect balance and compactness.

The camera body is made of light metal alloy and is remarkably sturdy, all exposed metal parts being chromium plated for utmost durability.

All "Zorki" cameras are supplied with coated lenses to ensure the best results.

The "Zorki" may be operated either hand-held or set on a tripod and with careful handling and intelligent use will give excellent service and perfect photographic results.



2—Picture counting dial.

The dial automatically records each photograph taken.

3—Dial settings lugs.

The lugs are used for turning the picture counting dial, anti-clockwise and against the direction of the arrow on the winding knob 1, to the mark "O".

4—Counting arrow.

The arrow indicates the number of photographs taken.

5—Shutter release button.

The button has a tapped hole for screwing a cable release.

6—Reversing lever.

The lever disengages the automatic coupling of the film advance and shutter mechanism. When the exposed film is to be rewound back into the film magazine keep the lever set at "B". While making exposures keep the lever at advance position.

7—Shutter speed dial.

The dial is used for setting shutter speeds from $^1/_{20}$th to $^1/_{500}$th of a second and bulb (Z) exposures.

Figures 20, 30, 40, etc. on the dial correspondingly identify $^1/_{20}$, $^1/_{30}$, $^1/_{40}$, etc. of a second. Before setting the shutter speed the winding knob 1 must be wound one complete turn. Setting is done by slightly lifting the dial and turning it to the proper position required.

The dial may be turned across the scale Z, 20, 30, 40, 60, 100, 200, and 500, and back; turning between Z and 500 is prohibited.

Specifications

Size of film	35 mm
Size of picture	24×36 mm
Film magazine capacity	36 pictures
"Industar-22" type lens:	
focal length	50 mm
full aperture	f/3.5
Diaphragm opening	f/3.5; f/4; f/5.6; f/8; f/11; f/16
Distance scale	1; 1.25; 1.5; 1.75; 2; 2.5; 3; 4; 5; 7; 10; 20 m, and infinity
Shutter exposure speeds	$^1/_{20}$; $^1/_{30}$; $^1/_{40}$; $^1/_{60}$; $^1/_{100}$; $^1/_{200}$; $^1/_{500}$ sec., and Bulb (Z)
Range finder base	38 mm
View-finder for lenses of focal length of	50 mm
Camera overall dimensions	70 × 70 × 135 mm
Camera weight	580 g

in Fig.11. Be sure the uncut side of the film is pressed tightly against the spool flange.

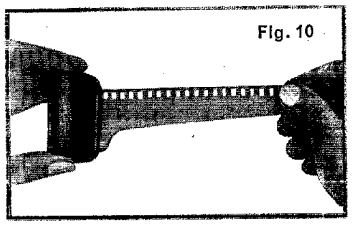


Fig. 10

6. Set the open camera with the lens directed away from you. Holding the take-up spool (Fig. 12) in the left hand and the magazine in the right steadily lower them into their respective seats, with the film inserted into the slit. If the magazine does not reach the bottom of the seat the rewinding knob 12 (Fig. 2) is to be slightly turned.

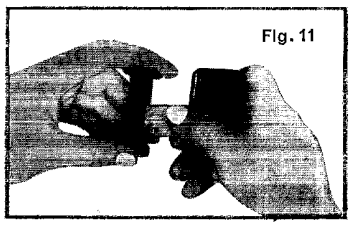


Fig. 11

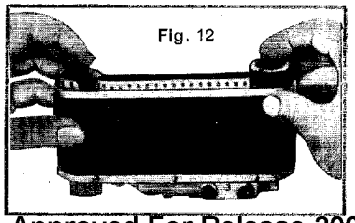


Fig. 12

thus tighten the film already rolled on the spool; this will produce scratches.

Always make certain that no finger-prints are left on the emulsion side of the film, and even on the other side. The film should be held lightly by the perforated edges.

3. Insert the film spool into the cartridge with the leader end of the film in the cartridge slit (Fig. 7) and replace the cover.

All other operations with the magazine may be performed in daylight.

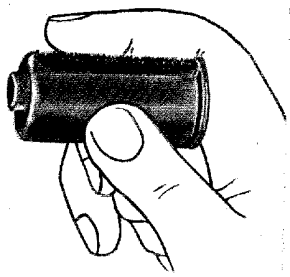


Fig. 5

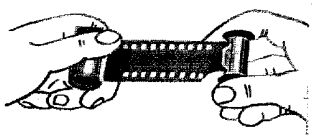


Fig. 6

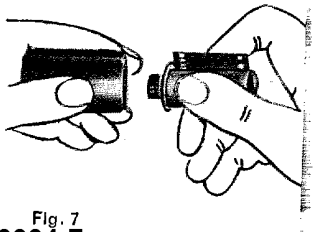


Fig. 7

The outside parts of the camera

Fig. 2 shows general view and the outside parts of the "Zorki" camera:

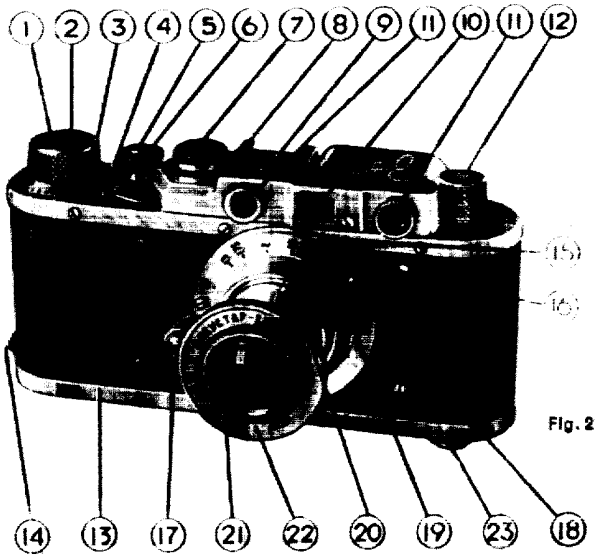


Fig. 2

1—Shutter winding knob.

Turn the winding knob in the direction indicated by the arrow only. One complete turn winds the shutter, advances the film to the next picture, and registers one count on the dial 2 at the base of the knob.

Magazine Loading

Fig. 3

Fig. 4

The "Zorki" film magazine (Fig. 3) contains three parts: cartridge, spool, and cover (Fig. 4). Before loading the magazine must be disassembled. To accomplish this take the magazine as it is shown in Fig. 5 and gently knock the spool head against a rigid object.

The following loading operations should be carried out in complete darkness, unless the proper safety lights are used:

1. Cut the spool end of the film to the correct taper and fasten it on the spool under the spring as shown in Fig. 6.

   Care should be taken to have the emulsion side of the film facing the spool axis.
2. Wind the film tightly on the spool. Do not attempt to pull the film and

Camera Loading

Though the "Zorki" film magazines are daylight loading it is still necessary to take precautions when loading the camera. Therefore, all loading operations listed below must be performed in subdued light, and on no account in direct sunlight:

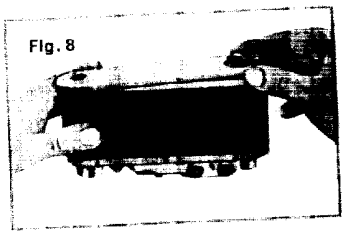


Fig. 8

1. Take the camera in a manner shown in Fig. 8, raise the handle of the lock (23 on Fig. 2) and give it half a turn counter-clockwise so as to have the arrow on the lock point to "open" (ОТКРЫТО).
2. Pull up the right end of the base plate (13 on Fig. 2) and take it off the locating pin (14 on Fig. 2).
3. Pull the take-up spool (Fig. 9) out of the camera.
4. Pull the leader end of the film out of the magazine (not more than 10 cm) and cut it to the correct shape (Fig. 10) using a trimming guide. It should be noted that no cut is made through a perforation on the film edge.

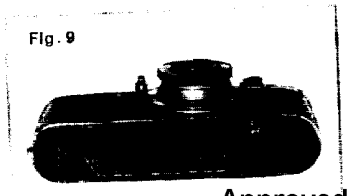


Fig. 9

5. With the take-up spool (Fig. 11) held in the left hand and the loaded film magazine in the right fasten the leader end of the film under the spool spring as shown

Dotted line (Fig. 9) shows the position of the film when properly loaded in the camera.

7. Replace the base plate (Fig. 8) and tightly press it down; turn the handle of the lock clockwise for half a revolution so as to have the arrow on the lock point to "closed" (ЗАКРЫТО).
8. In order to pass the film which was exposed to light while loading, turn the winding knob and click the shutter twice by pressing the release button 5 (Fig. 2).

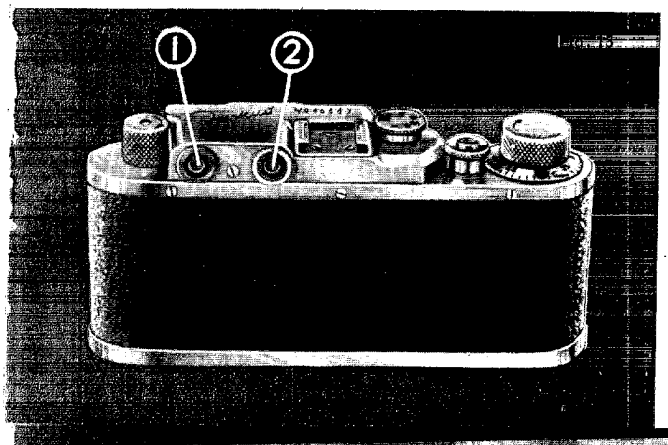
   Each time the shutter winding knob is turned, the rewinding knob 12 (Fig. 2) turns in a reverse direction, thus indicating that the film is properly passing to the next exposure. If this is not the case the film leader should be wound back off the take-up spool and the film reloaded into the camera.
9. Set the picture counting dial 2 (Fig. 2) at "0" opposite the small counting arrow 4.

Taking the picture

The camera may be operated hand-held, set on a tripod or on any flat surface.

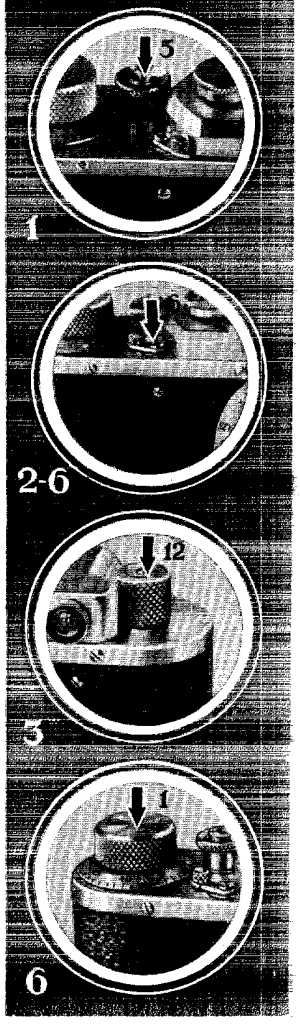
When preparing to make a picture follow these steps:

1. Pull out and lock the lens in position;
2. Set the lens diaphragm ring;
3. Turn the shutter winding knob one complete turn;
4. Set the shutter speed dial;
5. Secure exact focus looking through the range-finder eyepiece 1 (Fig. 13);
6. Look through the view-finder 2 (Fig. 13) and compose the picture;



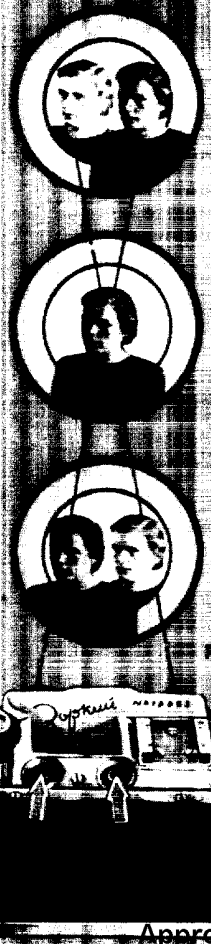
correct way of holding the camera for both horizontal and vertical pictures and Figs. 16 and 17—the wrong way. The correct combination of the diaphragm opening and exposure is an essential picture making point. Therefore, to avoid any danger of spoiling the picture because of incorrect combination of exposure and diaphragm opening use exposure meters.

4. Open the camera as it was described previously;
5. Remove the magazine;
6. Shift the reversing lever 6 (Fig. 2) to the advance position and turn the shutter winding knob 1 (Fig. 2). The camera may now be loaded again.



Gradually press the shutter release button and make the exposure. When taking the picture remember that the camera must be held steady. If it is moved during the exposure, the picture will not be sharp. Therefore, when pressing the release button with the fore-finger avoid jerking the camera by abruptly pushing the release. Instead, hold the finger on the release button and gradually squeeze the button down. Wherever possible it is best to use shutter speeds of $^{1}/_{50}$th or $^{1}/_{60}$th of a second or faster when the camera is held in the hands, in order to avoid any possible motion during exposure.

Optical range and depth



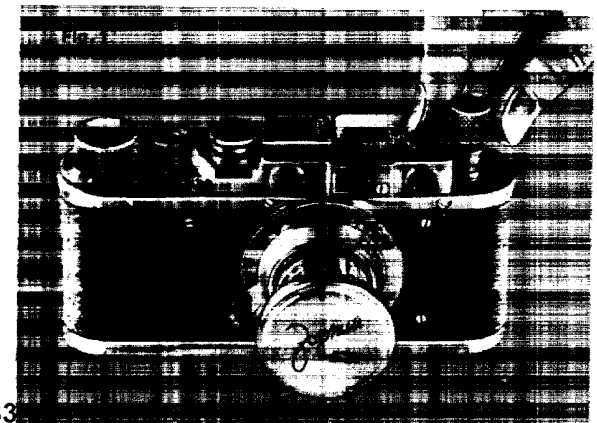
The range-finder determines the camera-to-object distance. The "Zorki" range-finder is coupled to lens and is used for automatic focusing. Focusing is done looking through the range-finder eyepiece (1 on Fig. 13), holding the camera in a manner illustrated in Figs. 14 and 15.

A reddish transparent circle against a greenish background will be seen in the centre of the range-finder field of view. With the lens set at infinity, objects that do not lie at infinity (practically at distances less than 100 m) will be viewed in twin (Fig. 19). In this case, by pressing the button of the lens focusing lever, release the lens mount from the infinity setting, and move the lever back and forth, while looking through the range-finder, until the images of an object in the reddish field are

Camera Unloading

To unload the camera after 36 exposures have been made follow the procedure mentioned below:

1. Cover the lens by the cap and press the release button 5 (Fig. 2);
2. Shift the reversing lever 6 to position indicated by letter "B";
3. Pull up the rewinding knob 12 (Fig. 2) as illustrated in Fig. 18 and turn it in the direction of the arrow, until a resistance counteracting the rotation (the increase in effort applied to rewinding the film strip of the spool) and the cessation of the release button turning, indicate the completion of the rewinding process;



-finder, distance of field scales

When the two images are exactly superimposed the correct focus has been obtained and a figure corresponding to camera-to-object distance (in meters) will be read on the distance scale 16 (Fig. 2) opposite the notch on the dial 19 (Fig. 2).

Should the exact distance to the object be known, the lens can be focused without the use of the range-finder by setting the notch on the dial 19 against the corresponding figure on the scale 16 indicating camera-to-object distance.

The depth of field is a distance between the nearest and farthest objects in a scene which will be sharp in the picture. Therefore, when objects of considerable depth or a series of objects located at various distances are to be photographed it is necessary to use the depth of field scale 19 (Fig. 2). This scale is adjacent to the distance scale and is marked with the diaphragm opening numbers spaced on either side of the distance indicating mark. After focusing the depth of field scale tells you the limits of the depth for the diaphragm opening you are using. The depth of field runs from the diaphragm number on one side to the same number on the other side. For instance, a lens is focused at a distance of 4 m with a diaphragm opening of 16; thus the image to be sufficiently sharp within distances ranging between 2 m and infinity.

It must be pointed out that the depth of field decreases considerably as the diaphragm opening is made bigger. Should the lens, in the above example, be set with a diaphragm opening of 5.6, the depth of field shall be limited to values between 3 and 7 m.

Camera Set

Complete camera set includes:
"Industar-22" coated lens
Take-up spool
Yellow filter
Lens cap
Film magazine
Leather carrying case with shoulder strap
Instruction manual and certificate of inspection.

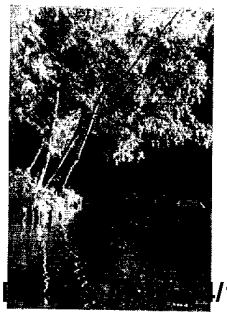
Accessories supplied at extra cost

Cable release
Light yellow filter
Dark yellow filter
Orange filter
Case for filters
Spare film magazines
Universal type camera tripod
Film end cutting guide
Film inspection magnifier—6×
У— 2 type enlarger.

The "Zorki" camera may also be supplied with a 3K 50—50 mm focal length, f/2 or f/1.5 full aperture coated lens.

The 3K50/2 lens "Zorki" camera is shown in Fig. 20:

1—Distance scale;
2—Lens focusing lever;
3—Depth of field scale;
4—Diaphragm scale;
5—Front ring showing lens No, focal length and full aperture.



The 3K50/1.5 lens "Zorki" camera is shown in Fig. 21:

1—Distance scale;
2—Depth of field scale;
3—Diaphragm scale;
4—Front ring showing lens No, focal length and full aperture;
5—Diaphragm setting ring.

The 3K50/2 lens "Zorki" Camera

Specifications

3K50/2 type lens:

focal length	50 mm
full aperture	f/2
Diaphragm opening	f/2; f/2.8; f/4; f/5.6; f/8; f/11; f/16; f/22
Distance scale	1; 1.2; 1.5; 1.7; 2; 2.5; 3; 4; 5; 7; 10; 20 m, and infinity
Camera overall dimensions	70 × 70 × 135 mm
Camera weight	590 g

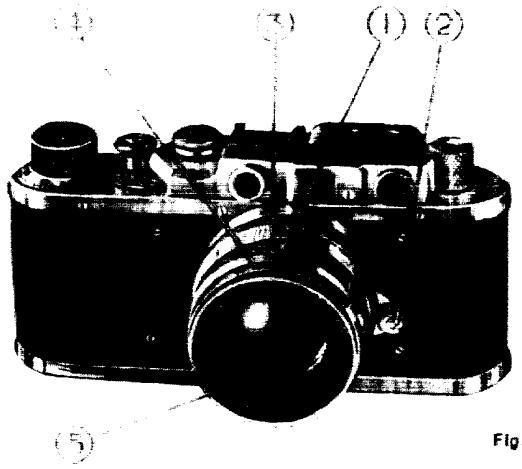


Fig. 20

Care of the Lens

It is quite evident that such a delicate and accurate piece of equipment as lens requires special care and can easily be ruined by careless handling.

To get the best out of your lens take good care of it:

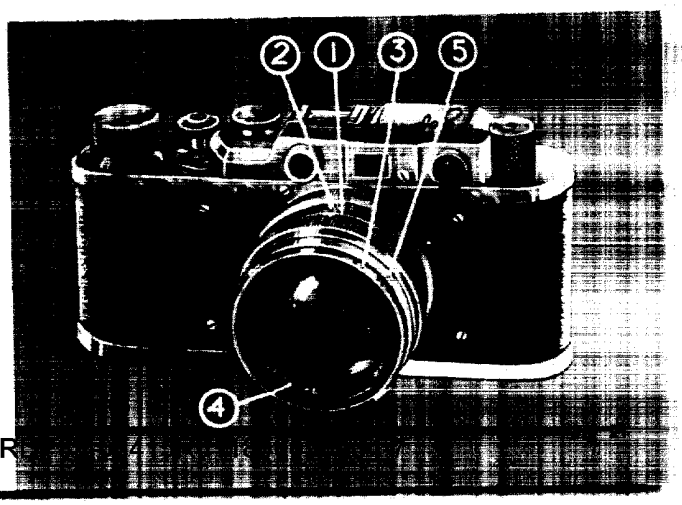
1. Keep the lens surfaces free from dust and other impurities. When the lens is attached to the camera and not in use keep it covered with the cap.
2. Should the surfaces show deposits of dust or other impurities do not try to remove it by rubbing the surface with your fingers. You may wipe the surfaces with a piece of chamois or flannel. You may also use a fine camel-hair brush. In any case it is imperative that the surface be wiped very gently.
3. Never put your fingers on its surfaces.
4. Do not expose it for long periods to direct rays of the sun.
5. Do not subject it to sudden and extreme temperature variations, nor keep it in damp or warm places.
6. Do not allow the lens to fall or to get a sudden jar.
7. Never take it apart yourself for cleaning.

The 3K50/1.5 lens "Zorki" Camera

Specifications

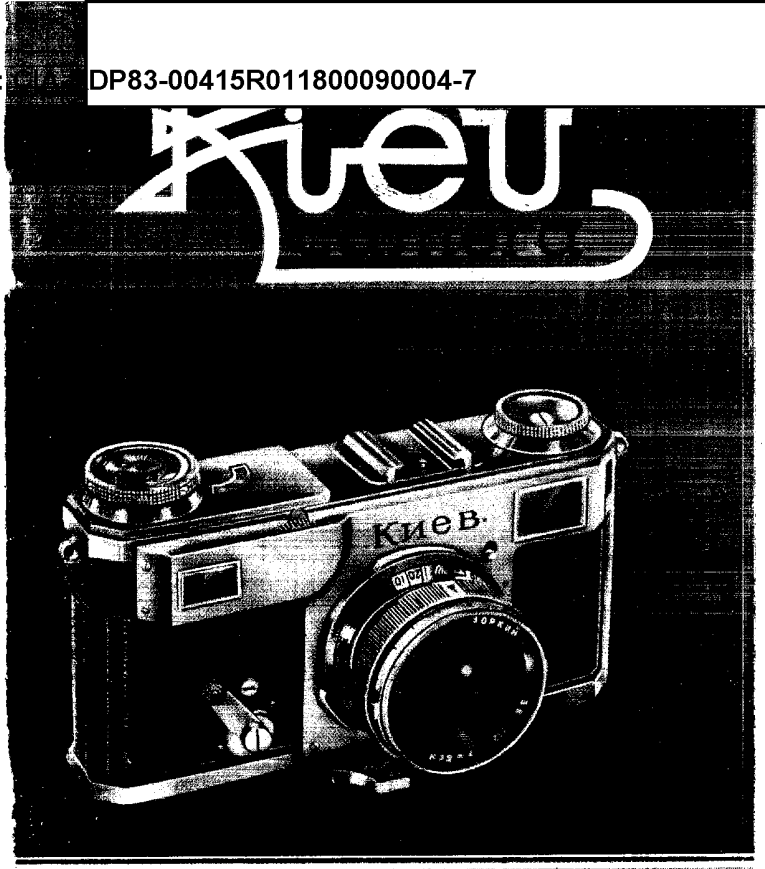
3K50/1.5 type lens:

focal length	50 mm
full aperture	f/1.5
Diaphragm opening	f/1.5; f/2; f/2.8; f/4; f/5; f/6; f/8; f/11; f/16; f/22
Distance scale	1; 1.2; 1.5; 1.7; 2; 2.5; 3; 4; 5; 7; 10; 20 m, and infinity
Camera overall dimensions	70 × 75 × 135 mm
Camera weight	605 g



Contents

Vneshtorgizdat Order No. 2385



Vsesojuznoje Exportno-Importnoje Objedinenije
"Stankoimport"
MOSCOW USSR

PHOTOGRAPHIC CAMERA

„KIEV"

Instruction Manual

Vsesojuznoje Exportno-Importnoje Objedinenije
STANKOIMPORT

„KIEV" FEATURES

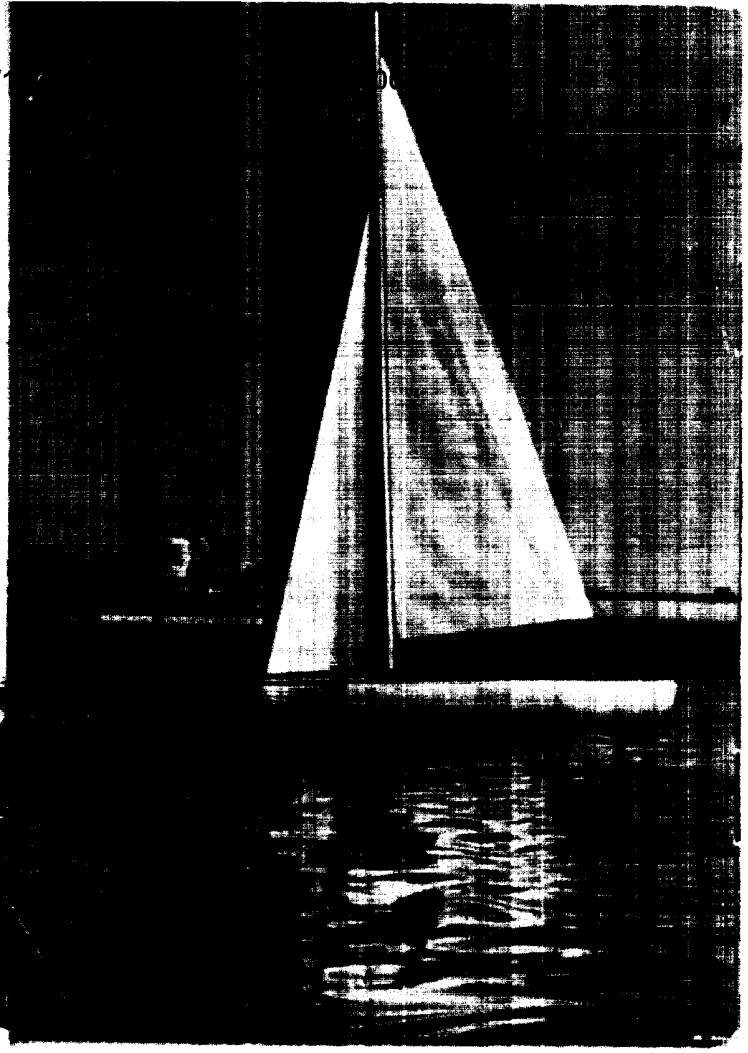
Fig. 1

The "Kiev" (Fig. 1) represents the highest development of the 35 mm camera.

It is a precision miniature camera; with careful handling and intelligent use, the camera will give excellent service and photographic results.

It uses a standard perforated 35 mm motion picture film in lengths of about 1.6 m, which is sufficient to make up to 36 double frame exposures, 24 × 36 mm in size.

The "Kiev" is of small size and light weight, and the proportions of the body have been nicely designed for perfect compactness.



The entire camera body is die-cast from light metal alloy and all the sensitive units, such as range-finder, lens focusing and shutter mechanisms are completely inclosed in the strong metal housing.

The body is handsomely covered with black leather and all exposed metal parts are chromium plated for durability and appearance.

The automatic picture counter shows the number of exposures taken. Double exposures are completely eliminated by the automatic film feed which, on winding the shutter, automatically transports the film necessary for the next exposure.

The range-finder and a larger view-finder are combined in one ensuring speedier manipulation.

The winding knob is situated on top of the camera with the shutter release located in the centre of the knob. All controls are operated by the right hand, the middle finger operating the focusing wheel and the fore-finger the release of the shutter.

Shutter speeds are set by adjusting the shutter winding knob.

The shutter speeds provided from $^1/_2$ to $^1/_{1000}$th of a second and bulb (B) exposure.

The metal curtain of the "Kiev" shutter operates with a high degree of accuracy. The shutter speeds can be set before or after winding.

A self-timing device permits delayed action release for taking your own picture; the release takes place automatically after a delay of approximately 9 12 seconds.

All "Kiev" lenses are conveniently and quickly interchanged by means of a bayonet mount; lenses of 50 mm focal length are placed in the inner bayonet mounting and all other lenses in the outer mounting.

All "Kiev" cameras are supplied with coated lenses to ensure the best results.

Besides unlimited possibilities for the amateur photographer "Kiev" camera can be widely employed for colour photography and any special kind of photography, for reproduction work, for printing of film positives, etc.

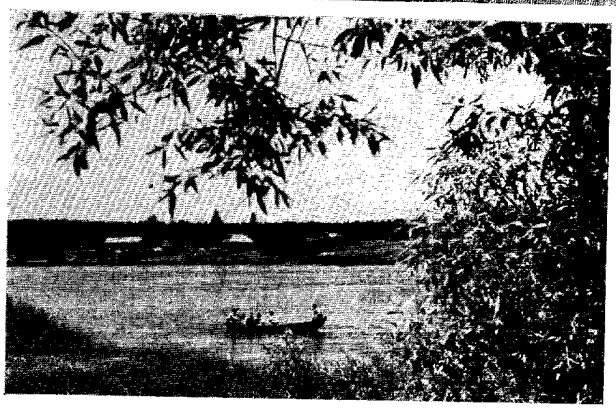
The "Kiev" camera may be operated hand-held, set on a tripod or on any flat surface.

This Instruction Manual was prepared to help you make good pictures.

Your pictures will be better pictures right from the start if you spend a few minutes to get acquainted with your camera.

This Manual gives you quickly and simply the essentials of camera operation.

Vsesojuznoje Exportno-Importnoje Objedinenije "Stankoimport"



Specifications

Size of film	35 mm
Size of picture	24 × 36 mm
Film magazine capacity	36 pictures
"Jupiter" universal type lens:	
focal length	50 mm (more exactly 52 mm)
full aperture	f/2
Lens opening	f/2, f/2.8, f/4, f/5.6, f/8, f/11, f/16, f/22
Distance scale	1, 1.15, 1.3, 1.5, 1.7, 2, 2.5, 3, 4, 6, 10, 20 m and infinity
Shutter exposure speeds	$^1/_2$, $^1/_5$, $^1/_{10}$, $^1/_{25}$, $^1/_{50}$, $^1/_{125}$, $^1/_{250}$, $^1/_{500}$, $^1/_{1250}$ sec. and Bulb (B)
Range-finder base	50 mm
View-finder for lenses of focal length of	50 mm
Camera overall dimensions:	
folded	55×85×140 mm
in operating position	65×85×140 mm
Camera weight	650 g

setting lever; 12—Release button for delayed action setting lever; 13—Range-finder object glass; 14—Strap eyelets; 15—Picture counter adjusting wheel; 16—Camera back cover; 17—Camera opening and closing latches; 18—Button for releasing film rewinding knob; 19—Range- and view-finder eyepiece.

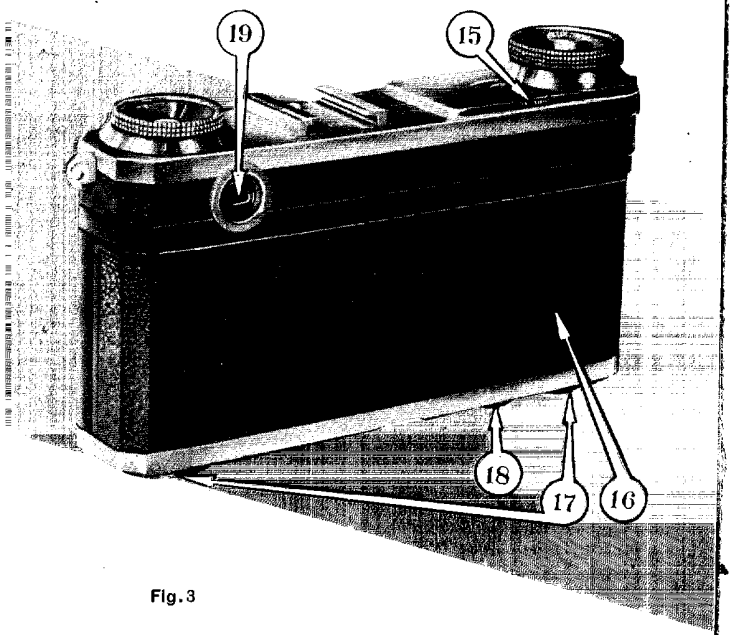
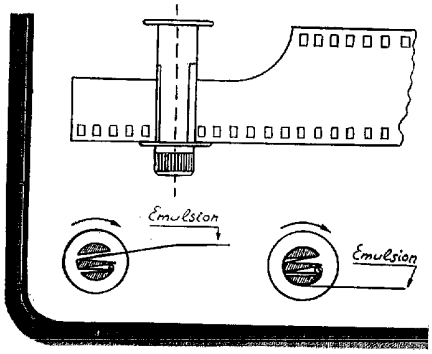
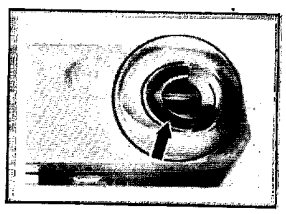


Fig. 3

Fig. 5



Camera Loading



The camera may be loaded in daylight (bright sunlight is not recommended).

The camera is opened after the two latches 17 (Fig. 3) on the camera bottom have been swung upwards, turned over half a circle and set against the stop.

Camera part names

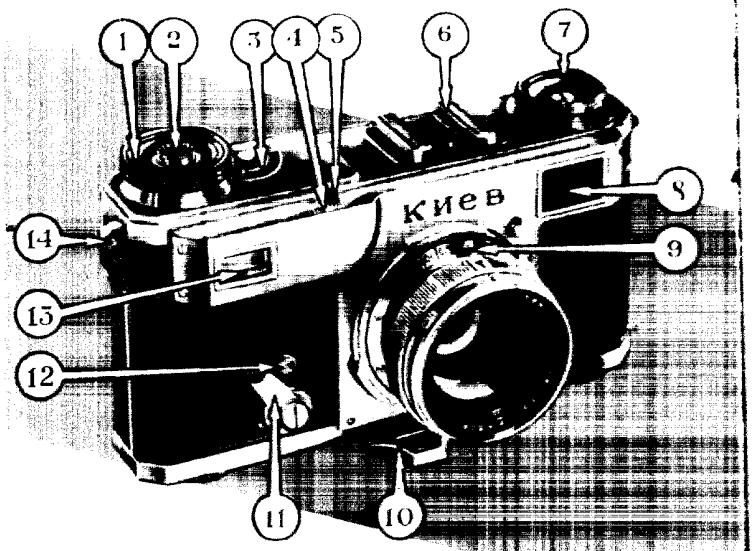
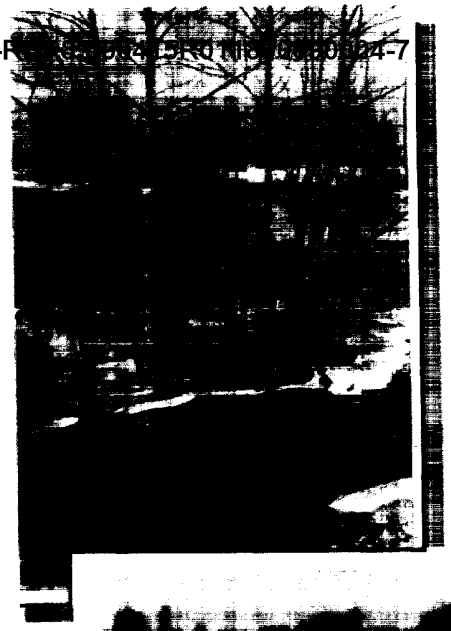


Fig. 2



Figs. 2 and 3 show general view of the camera; the camera consists essentially of the following parts: 1 - Shutter winding knob with speed dial; 2—Shutter release button; 3 - Picture counter; 4 - Focusing wheel; 5 - Infinity range setting lever; 6 - Universal view-finder shoe; 7 - Film rewinding knob; 8 - Range- and view-finder object glass; 9 - Holding lens spring catch; 10 - Camera base support; 11 - Delayed action

Draw the camera back slightly along its grooves and then lift it away from the camera body.

Fasten the free end of the film to the take-up spool 2 (Fig. 4) in the same manner as it has been done previously with the magazine spool.

Insert the magazine into the camera so as to fit the magazine claw into the slot provided in the camera body. Simultaneously the take-up spool is engaged by its driver and the film is directed, so that the transporting sprocket teeth 3 engage the film leader perforations.

Replace the camera back.

The magazine opens automatically upon closing the camera back, thus allowing the film to pass freely through the magazine slits and avoiding any possible scratching of the emulsion.

The unexposed film part is fed to the picture aperture after the shutter has been wound up and released three times. While the shutter is being wound up, the rewinding knob should rotate in counter-clockwise direction. If the rewinding knob does not rotate, there is something wrong inside the camera, and the back must be removed to find out the cause of the trouble.

Magazine Loading

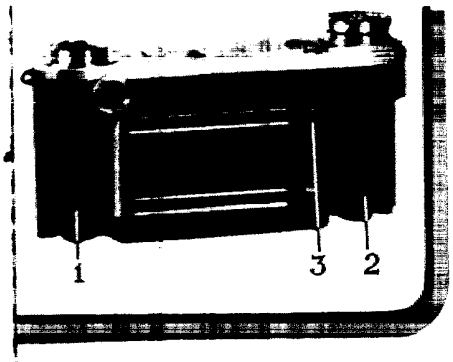


Fig. 4

The "Kiev" camera magazine 1 (Fig. 4) consists of a central spool, an inner casing and an outer casing.

The film is loaded into the magazine in complete darkness.

The inner casing may be taken out of the outer casing only after the nickeled button on the magazine inner casing has been pressed and the letter turned until the apertures in both casings are over each other.

Insert the film end, cut to shape, into the spool slit and fasten it as shown in Figure 5.

The film is wound on the spool with the emulsion side inwards (if the spool is hold so as to face its head, the turns are to be wound clockwise). Put the spool into the inner casing in a manner to pass the spool head through the casing bottom.

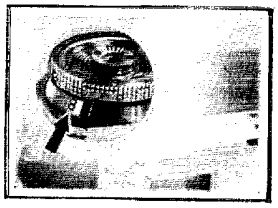
Insert the inner casing into the outer casing leaving the film end free.

Close the magazine by turning the inner casing counter-clockwise (the magazine is to be held so as to face the head).

All other operations with the magazine may be performed in daylight.

Exposure Speed Setting

Exposure speed setting is achieved by means of the shutter winding knob 1 (Fig. 2). Figures 2, 5, 10, 25, etc. on the exposure speed scale correspondingly identify $^1/_2$, $^1/_5$, $^1/_{10}$ $^1/_{25}$, etc. of a second. The knob is to be pulled upwards and turned until the black dot is opposite the figure indicating the exposure speed selected, after which the knob is to be pushed downwards.



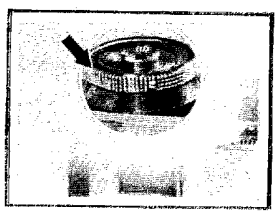
The catches for the $^1/_{500}$th and $^1/_{1250}$th of a second speeds are very close to each other.

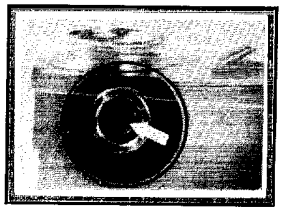
The $^1/_{500}$th speed is set by lifting the knob and turning forward from $^1/_{250}$th second until the catch allows the knob to drop into position. When setting the shutter to $^1/_{1250}$th second the knob is pulled upwards and turned as far towards the marking 1250 as it will go, and in the correct position it drops into place as the catch is reached. Exposure speed setting may be achieved with the shutter wound up or released. When setting shutter speeds it is essential that the shutter is either fully wound up or fully run down.

Should an exposure speed exceeding $^1/_2$ sec. be required, the black dot is to be set opposite letter "B" (bulb exposure). With this setting, the shutter will stay open as long as the button 2 is depressed and will be closed only when the button is released. When considerably delayed exposure is needed, the release button 2 is to be secured in depressed position by turning it counter-clockwise until a stop is reached.

Shutter Winding and Film Transport

The shutter is wound up by turning the shutter winding knob 1 (Fig. 2) in clockwise direction until a stop is felt. The index dot on the winding knob should be previously set opposite figure indicating the exposure speed selected.

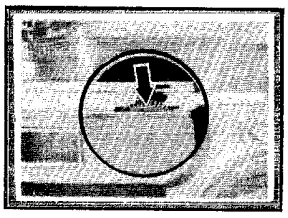




Focusing

Focusing is done in the following manner: when looking through the range- and view-finder eyepiece 19 (Fig. 3), a double image of the object will be seen in the centre of the field of view, in a rectangular field differing in colour with the general background (see next page).

Turning the focusing wheel 4 (Fig. 2) both these images are brought together. When they are exactly superimposed the lens is accurately focused at the distance of the object seen in that portion of the field.



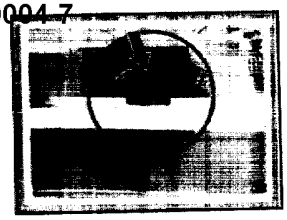
The view-finder, mounted into the range-finder, is designed for standard lenses of rated 50 mm focal length. For all other lenses view-finders with corresponding fields of view should be used.

Occasions may arise when for one reason or another, the use of the range-finder is either inconvenient or even impossible. In such cases, focusing is achieved by means of the distance scale measuring distances from camera to object. Lenses of 50 mm focal lengths have the distance scale attached on the exterior ring of the bayonet mount. All other lenses have this scale mounted on the lens itself. The scale divisions are shown in meters.

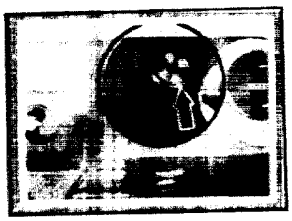
Lens opening figures engraved on the bayonet exterior ring are given on both sides of the distance scale index.

These figures are used to determine the depth of field of images with various lens openings. For instance, a lens of 50 mm focal length shall be focused at a distance of 4 m with a lens opening of 8; this allows the image to be sufficiently sharp within distances ranging between 2.5 and 10 m. It must be pointed out that the depth of field decreases considerably as the lens opening figure is made smaller. Should the lens be set at this same distance (4 m) with a lens opening of 2, the depth of field shall be limited to values between 3.5 to 4.4 m.

The picture counter dial 8 (Fig. 2) is to be rotated so as to bring the counter scale zero to coincidence with the arrow on the body top cover.



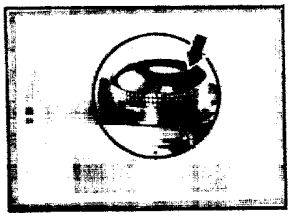
Camera Unloading

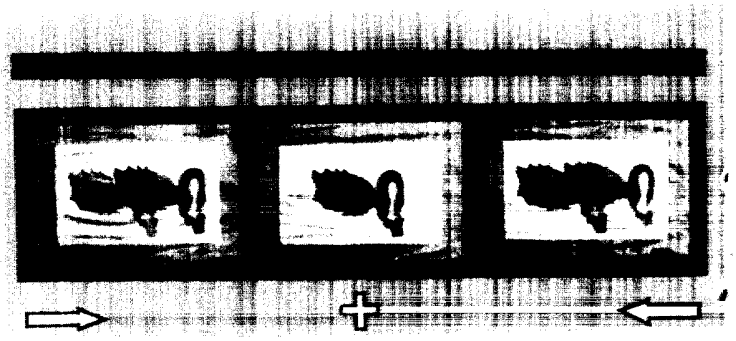


To unload the camera press the button 18 (Fig. 3) on the lower cover to the stop and then turn the film rewinding knob 7 (Fig. 2) in the direction indicated by the arrow, until a resistance counteracting the rotation (the increase in effort applied to unwind the film strip off the spool) indicates the completion of the spool-to-magazine rewinding process.

In order to avoid film breakage, the button should remain depressed for the entire rewinding period.

After the camera back has been detached, the magazine and take-up spool can be removed. While the camera back latches are being released, the magazine closes automatically.

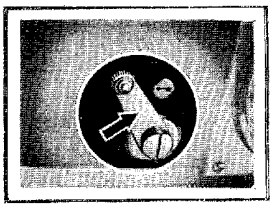




Simultaneously with the shutter being released, the film is wound on for the next exposure, while the picture counter dial 3 advances one division. Release of the shutter is achieved by depressing the release button 2.

When the camera is used on a tripod, the flexible cable release is screwed into the thread of the shutter release button.

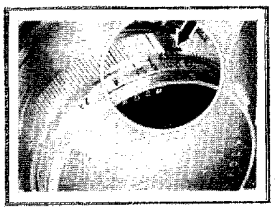
Self-timing device



The "Kiev" camera has a self-timing device which permits delayed action release by a built-in clock-work. The shutter is automatically released within a 9—12 second delay after it is set to operation.

Before setting the shutter self-timing device to operation, it is necessary to wind up the shutter and then to turn the delayed action setting lever 11 (Fig. 2) counter-clockwise to the left and down till it comes to a stop. The self-timing device is set to operation after the release button 12 has been shifted in the direction indicated by the arrow. The shutter may be wound up or shutter speed set with the self-timing device in either wound up or released position. Should the shutter be set opposite letter "B," the exposure speed, with the self-timing device set to operation, will be 1—3 seconds.

Lens



The "Kiev" camera operates with a standard lens of 50 mm focal length and f/2 full aperture. When inoperative, the lens should be moved into the camera. Before making an exposure the lens must be pulled forward into the correct position.

The lens opening is set by turning the ring mounted on the lens. The lens opening setting is to be accomplished prior to focusing.

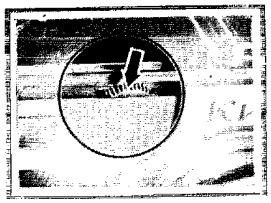
Inserting other Lenses than 50 mm Focal Length

All lenses other than those of 50 mm focal length are placed on the outer bayonet mount.

The lens is held, so that the two red dots, one on the camera front and the other on the lens itself, are opposite each other, and the lens is then turned to the left until a stop is felt.

The catch on the side of the lens will then be heard to snap into position.

The long focal length lenses are also coupled to the distance meter for focusing, and in order to make sure that the mechanism is working correctly the focusing ring on the lens should be turned.



When this is done, the focusing wheel 4 (Fig. 2) on the camera should also revolve.

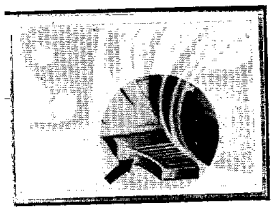
It is important to note that when using long focal length lenses the focusing must be done by adjusting the ring on the lens and not by turning the usual focusing wheel on the camera.

When using a long focal length lens, it is desirable to hold the camera during the exposure by grasping the lens with the left hand.

The special view-finders for long focal length lenses are placed in the universal view-finder shoe on top of the camera.

base support may be turned over and pointed forwards, so that the camera will stand up on a table or other flat surface.

Fig. 7



Care of the lens

It is quite evident that such a delicate and accurate piece of equipment as lens requires special care and can easily be ruined by careless handling.

To get the best out of your lens take good care of it:

Keep the lens surfaces free from dust and other impurities. When the lens is attached to the camera and not in use keep it covered with the cap.

Should the surfaces show deposits of dust or other impurities do not try to remove it by rubbing the surface with your fingers. You may wipe the surface with a piece of chamois or flannel. You may also use a fine camel-hair brush. In any case it is imperative that the surface be wiped very gently.

Never put your fingers on its surfaces.

Do not expose it for long periods to direct rays of the sun.

Do not subject it to sudden and extreme temperature variations, nor keep it in damp or warm places.

Do not allow the lens to fall or to get a sudden jar.

Never take it apart yourself for cleaning.

Camera Set

The complete camera set (Fig. 8) includes:

f/2-50 mm coated ("blue") "Jupiter" (3K-50/2) lens,

magazine with spool,

take-up spool,

lens-cap,

leather carrying case with shoulder strap,

cable release,

instruction manual and certificate of inspection.

Taking the picture

Fig. 6

The camera may be operated hand-held, set on a tripod or on any flat surface. During the exposure hold the camera steady.

Focusing is done by the middle finger of the right hand, while the fore-finger of this hand operates the shutter release.

The illustrations (Fig. 6 and 7) show the correct way of holding the camera for both horizontal and vertical pictures. It will also be seen that the shutter release should be pressed with the ball of the finger and not with the finger-tip.

The important points to observe for each exposure are:

- Adjust the lens opening to the desired number;
- Set the exposure time by the shutter winding knob, wind up the shutter;
- Focus the object to be taken with the distance meter;
- Slowly press the shutter release button until it clicks; any movement of the camera during exposure blurs the picture, therefore, hold your breath as you press the shutter release button.

After each exposure wind up the shutter, so that the camera is always ready for use.

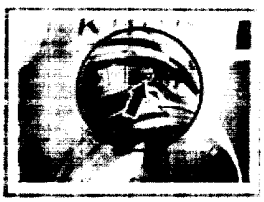
For a time exposure, the camera must always be placed on a tripod or some other firm support.

Use of eveready carrying case is recommended at all times. It protects camera from hard knocks, from the weather, and provides a convenient means of carrying. The camera may be used without removing it from the case.

On the rectangular camera tripod bushing is a hinged base support 10 (Fig. 2), which is usually folded backwards against the base of the camera. When, however, it is desired to hold the camera firmly, the

Changing the Lenses

Lenses of 50 mm focal length are placed in the inner bayonet mounting of the camera, and all other lenses in the outer mounting.



Removing the 50 mm Lenses

The camera focusing mount is first set at infinity. Then the thumb is pressed on the spring catch 9 (Fig. 2) so that the projection on the lens barrel, marked with a red dot, slides out of the spring catch holding it. A slight turn of the lens in a clockwise direction releases it, and it may then be carefully drawn out of the focusing mount.

Replacing the 50 mm Lenses

The lens is inserted into its mounting by reversing the operations mentioned above.

It is important to remember that the lens will only fit easily into the mount when the two red dots are opposite each other, and when the lens is held in the same plane as the front of the camera. By slightly turning to the left, the lens slips past the catch 9 (Fig. 2) and the latter snaps back, holding the lens firmly in the infinity position.

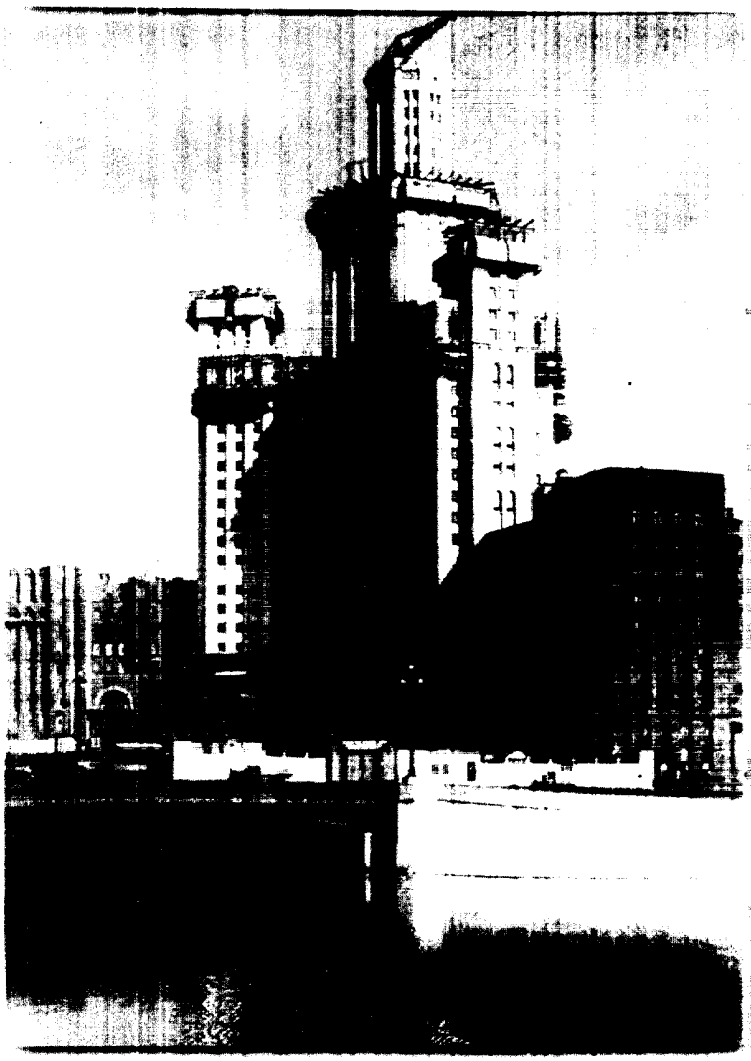
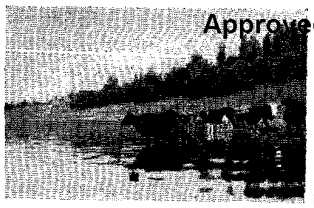
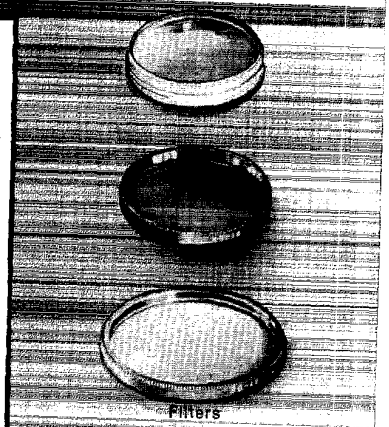


Fig. 8



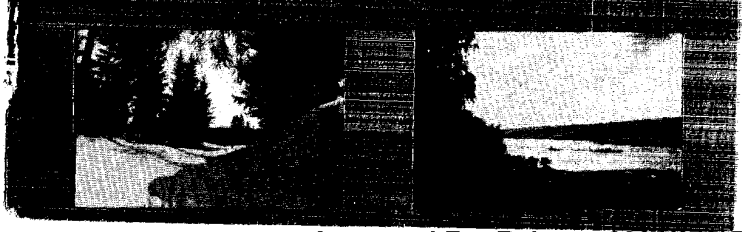
...ied at extra cost

"Jupiter" (3K-50)—50 mm focal length, f/1.5 full aperture lens.
"Jupiter" (3K-85)—85 mm focal length, f/2 full aperture lens.
"Jupiter" (3K-135)—135 mm focal length, f/4 full aperture lens.
"5K-35"—35 mm focal length, f/2.8 full aperture lens.

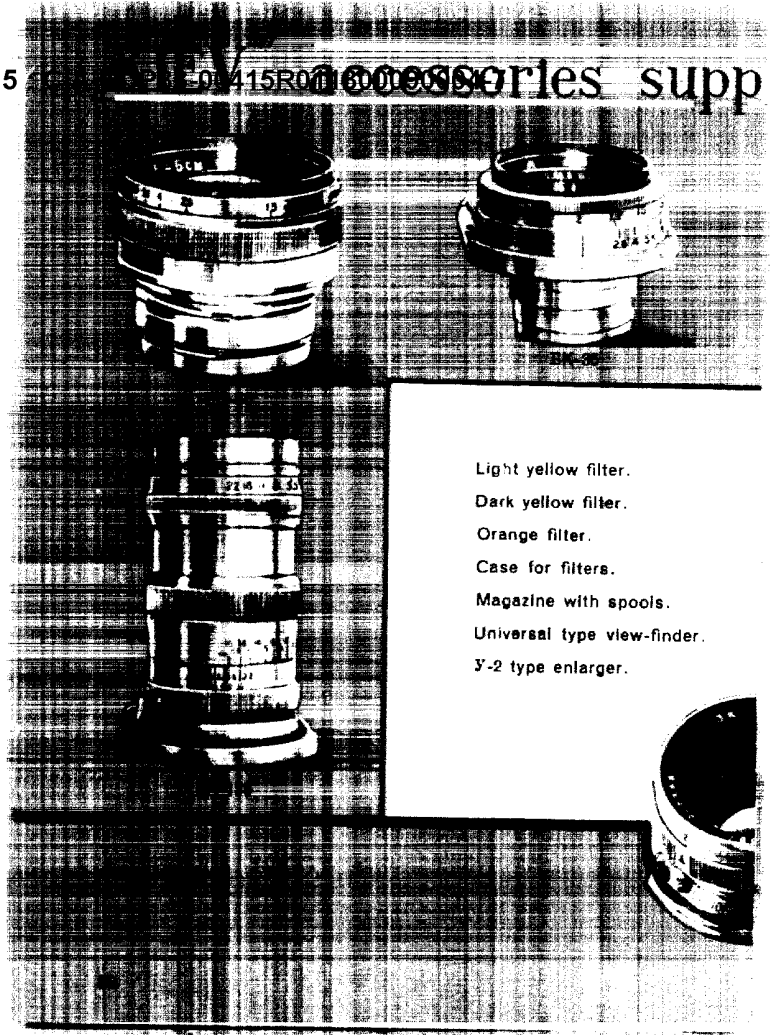


Contents

Vneshtorgizdat. Order No. 2248



Accessories supp



Light yellow filter.
Dark yellow filter.
Orange filter.
Case for filters.
Magazine with spools.
Universal type view-finder.
У-2 type enlarger.