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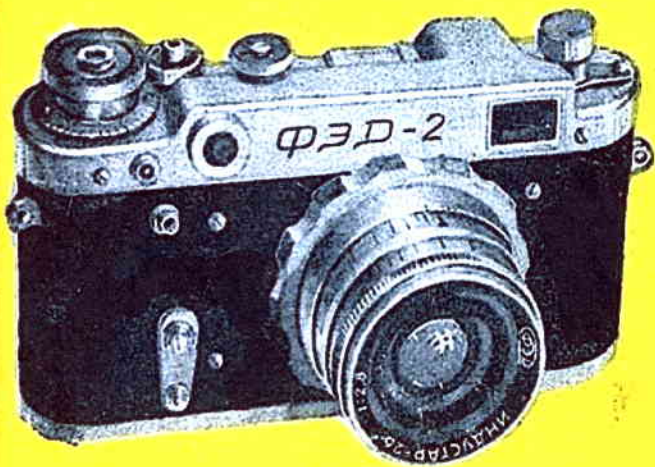
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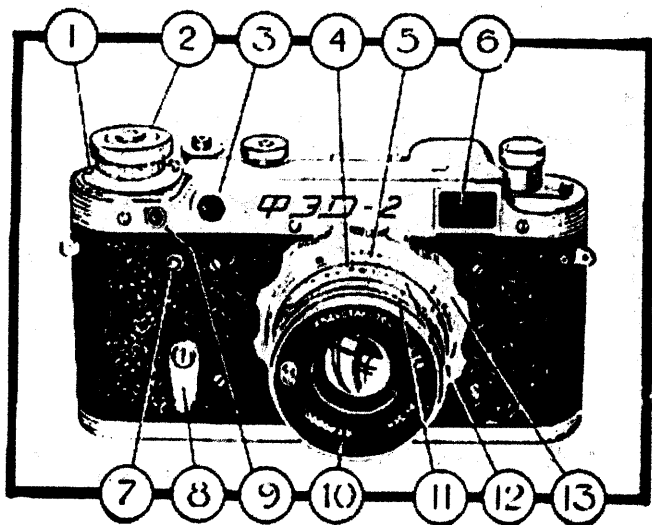
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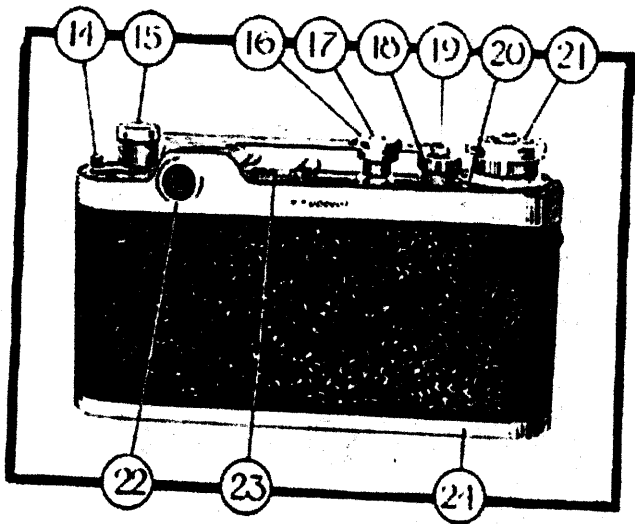
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**ROLL
FILM
CAMERA**
ФЭД-2



- 1 — Limb of exposure counter
- 2 — Shutter winding head
- 3 — Forward window of range finder
- 4 — Indicator of distance and diaphragm scales
- 5 — Distance scale
- 6 — Forward window of view and range finder
- 7 — Self-timer release knob
- 8 — Self-timer winding lever
- 9 — Synchronizer plug socket
- 10 — Forward lens nut
- 11 — Diaphragm scale ring
- 12 — Depth-of-field scale
- 13 — Focusing ring



- 14 — Dioptric focusing lever
- 15 — Film rewinding head
- 16 — Shutter speed head
- 17 — Shutter speed indicator
- 18 — Switch hub
- 19 — Release knob
- 20 — Exposure counter indicator
- 21 — Film type reminder
- 22 — View and range finder eyepiece
- 23 — Clamp
- 24 — Back

ФЭД-2 CAMERA DATA SHEET

TECHNICAL DATA

1. Negative material — 35 mm film.
2. Picture dimensions — 24 x 36 mm.
3. Magazine load — 1.6 m film for 36 pictures.
4. Shutter — curtain type.
5. Exposures — "B" (hand-operated), 1/30, 1/60, 1/125, 1/250, 1/500 sec.
6. Lens — coated anastigmat "Industar — 26M".
7. Focal length — $F = 52.4$ mm.
8. Relative aperture — 1:2.8.
9. Camera's resolving power:
 - a) in the central part of the field — 30 lines per mm.
 - b) on the brim of the field — 14 lines per mm.
10. Weight of camera with case — 900 g.
11. Camera No. _____
12. Lens No. _____

The camera was checked and found in full conformity with the specifications.

(signature)

ФЭД-2 Roll Film Camera

PREFACE

The given instruction contains only a brief description of the ФЭД-2 photographic camera and the basic rules of using it and cannot serve as a manual of photography.

Study the procedure according to the given description thoroughly before using the camera.

There may be slight discrepancies between the description and the camera owing to the technical development of the design.

I. DESCRIPTION OF CAMERA

The $\Phi\Theta\Lambda-2$ photographic camera is intended for taking various kinds of photographs and it can meet high demands of skilled amateurs, press photographers and scientists.

The high resolving power of the $\Phi\Theta\Lambda-2$ camera permits to obtain irreproachable photographs up to 13×18 cm size and more by means of an enlarger.

The wide speed range of the shutter, the fast lens, the synchronizer, the self-timer, the dioptric view finder focusing, the small weight and size of the camera make it irreplaceable for strolls, on holiday, in everyday life.

Easy loading and unloading, the presence of the range finder coupled with the view finder, the handiness of the $\Phi\Theta\Lambda-2$ camera make its use within the reach of an inexperienced amateur.



The simultaneity of shutter winding and film transport ensures the speedy preparation of the camera for shooting and excludes the possibility of erroneous (double) exposure.

The dismountable body facilitates the loading of film into the camera, simplifies the control of the interchangeable lens adjustment, permits to unload the camera easily without exposing the whole of the film.

The camera works with 35 mm perforated film. It is loaded with a magazine holding 1.6 m of film. Every such load gives the possibility of taking 36 photographs.

The ФЭД-2 camera is completed with a magazine which opens automatically when the camera cover is locked. The camera permits also the use of other types of magazines.

The range finder of the camera is coupled mechanically with the lens. It ensures exact lens focusing when the images in the range finder are superposed. The location of the range finder in the field of image of the view finder quickens and facilitates the process of shooting which is especially important in the photography of moving objects. It guarantees the exactness of lens focusing and the correct viewing at the moment of shooting. The presence of the dioptric focusing device which permits to regulate the range and view finder according to the photographer's sight within ± 2 diopters raises the precision of the range finder considerably.

The main lens for the ФЭД-2 camera is the one with the focal length 5 cm. The camera is completed with an «Industar-26M» lens which is screwed into the lens collar of the

camera. The threading of the collar ensures the fitting of interchangeable lenses. Self-timer built into the camera permits the photographer to take part in the photographed scene or to photograph himself.

On the camera there is a film type reminder which frees the amateur from the necessity of keeping in mind the type and sensibility of the film loaded into the camera.

The ФЭД-2 camera has a device for connection with multi-flashes.

Reverse taking-up mechanism gives the possibility of overloading the camera with another magazine with a new film load by usual (but not very bright!) lighting.

In the lower cover of the camera there is a tripod bush for setting the camera on a tripod and for fastening it in the carrying case. The carrying case design permits the hand camera operation without the camera being taken out of the carrying case.

II. TECHNICAL DATA

Size of negative	24 × 36 mm
Negative material	35 mm perforated film
Magazine load	1.6 m for 36 shots
Lens	«Industar-26-M» anastigmat, with non-reflection optics, relative aperture 1 : 2.8, focal length $F = 52.4$ mm, in rigid mount.

Limits of focusing
Range finder

from 1 m to ∞ (infinity)
optical, with a base of 67 mm,
coupled with the optical view
finder.

Shutter

Curtain type with speeds: B
(long, manual); 1/30; 1/60;
1/125; 1/250; 1/500 sec. When
the shutter is being wound,
the film is being transported
for the next shot and the
exposure counter is shifted by
one point.

Self-timer
Synchronizer

mechanical
non-regulated; it ensures the
contacts closing at the mo-
ment when the camera frame
is fully opened.

The tripod bush has standard thread 3/8".

The camera size in the case: 90 × 95 × 175.

The camera weight in the case, including the film load:
about 950 g.

III. HANDLING THE CAMERA

1. Opening and Closing the Camera

Undo the press-button and open the case cover. By turning the nut on the case bottom loosen the tripod screw holding the camera. Release the screw and, holding the camera as shown on Fig. 1, take it out of the case. When taking the camera out or putting it in, do not touch its optical details —

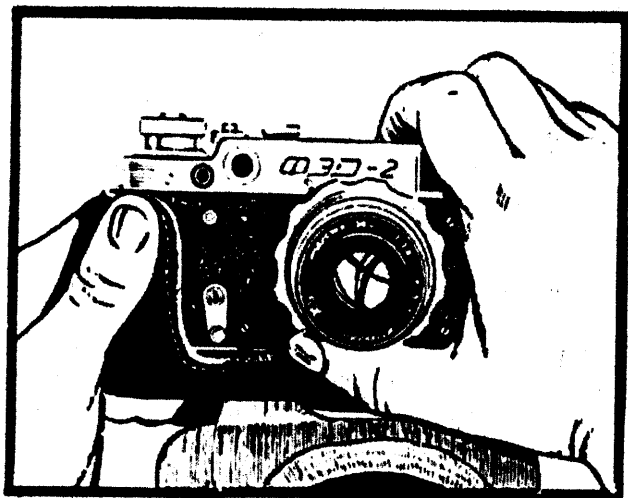


Fig. 1.

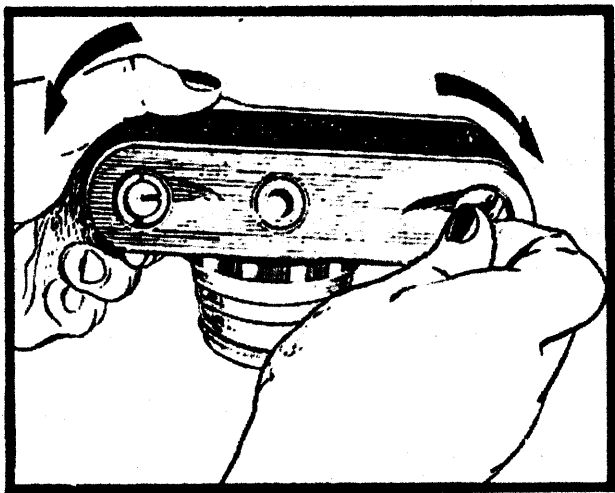


Fig. 2.

fingers always stain optics leaving marks on polished surfaces.

Having turned over the camera, raise the shackles of the locks with a nail and turn them half-way up as far as they will go, as shown on Fig. 2. Pressing with your thumbs, shift the back (24) so that its edge should go out of the groove and remove it (Fig. 3). The opened camera is shown on Fig. 4.

The magazine «a» lies in the camera body loosely and it can be easily taken out by pulling its head.

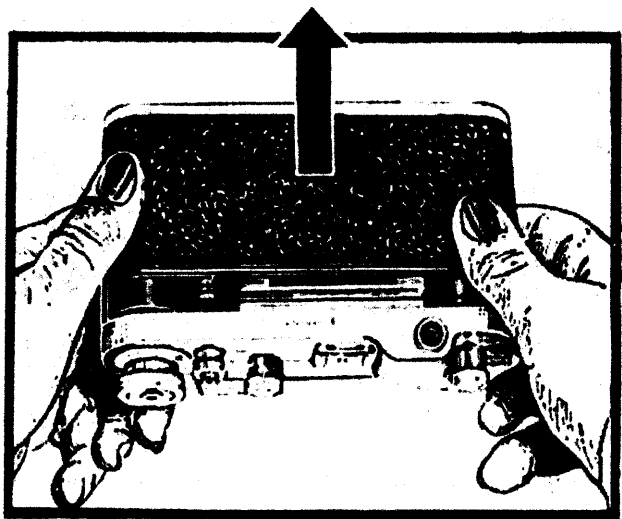


Fig. 3.

The take-up spool «6» is mounted on a collet and it can be taken out by pulling its head with an appreciable effort.

The camera is closed in reverse order.

Put the back as close as possible to the upper panel and, pressing it to the body, move it along the grooves till it meets the panel. Turn the lock shackles and sink them into the sockets. While sinking the shackles do not make excessive efforts, as a lock shackle may be sunk only when the lock is fully closed.

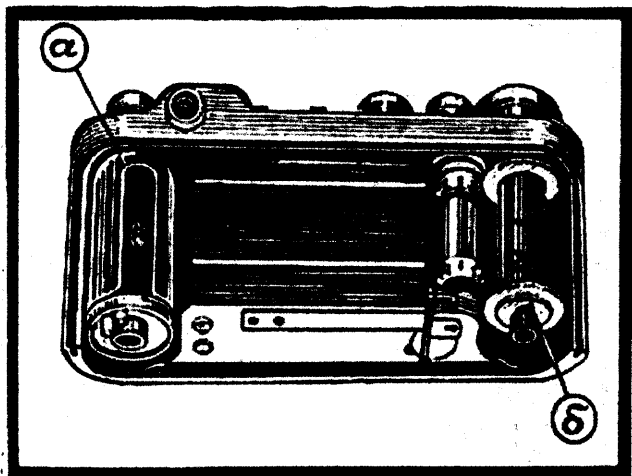


Fig. 4.

Having put the camera into the case, be sure to tighten the tripod bush in order to prevent the camera from falling out of the case. Before closing the case, set the lens on the symbol ∞ (infinity).

2. The Camera Magazine and Loading the Film Into It

The magazine of the ФЭД-2 camera consists of three parts: the holder, the sleeve and the spool.

In order to open and to disassemble the magazine, press the protruding button on the sleeve bottom and turn the sleeve

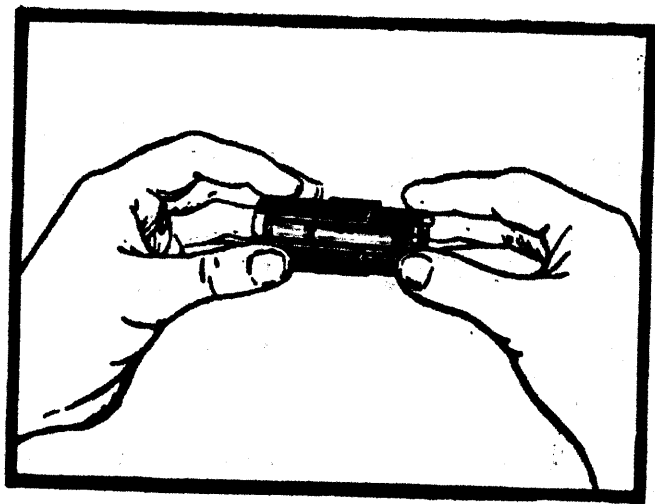


Fig. 5.

In the holder clockwise till the side recesses of the cylinders are brought into alignment. In this position the sleeve may be taken out of the holder (Fig. 5).

Holding the spool as shown on Fig. 6, insert the film end into the slit in the spool and pull it slightly backwards. The film will be safely fastened in the spool.

Wind the film, directing the emulsion layer to the spool axis and turning the spool counter clockwise.

Do not pack the spires by pulling the film by the loose end, as in this case the film spires rub against each other

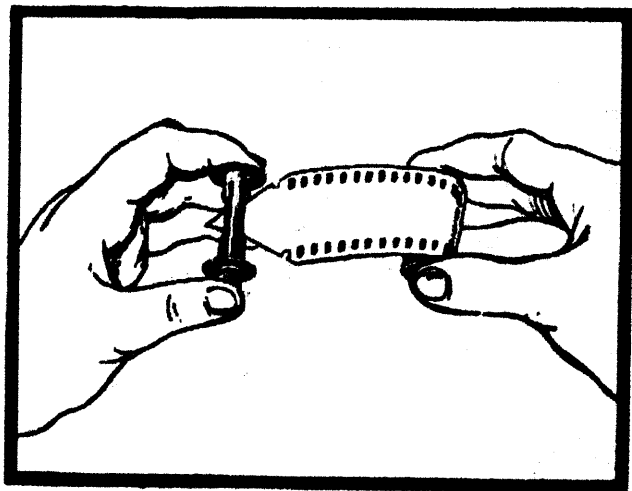


Fig. 6.

and make scratches on the emulsion layer. A correctly wound film must not jut out over the spool flanges.

Insert the spool with the film into the sleeve so that the spool head should go out from the opening in the bottom (Fig. 7). Insert the sleeve with the spool into the holder and close the magazine by turning the sleeve counter clockwise (directing the magazine head to the right hand) till the lock clicks (Fig. 8).

Load the film into the magazine in full darkness or by the light which the colour sensitivity of the film permits.

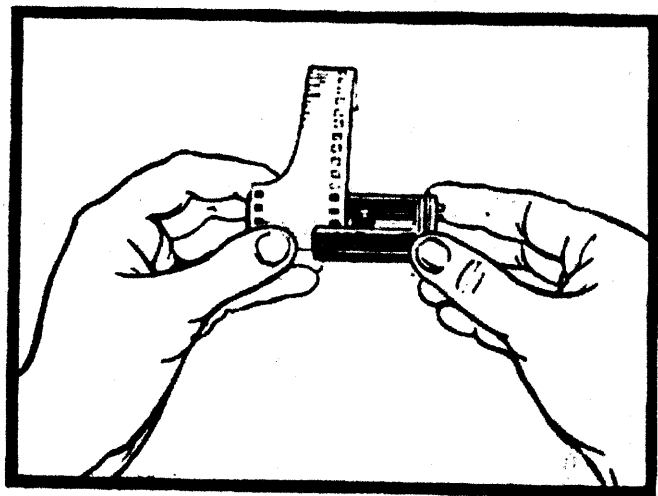


Fig. 7.

While loading the magazine and in general while handling the film avoid touching the emulsion layer and even the blank side with your fingers. The film should be taken only by the perforated edges.

In order to acquire a correct habit of loading the magazine we recommend the owner to train himself preliminarily by the light, using an exposed film.

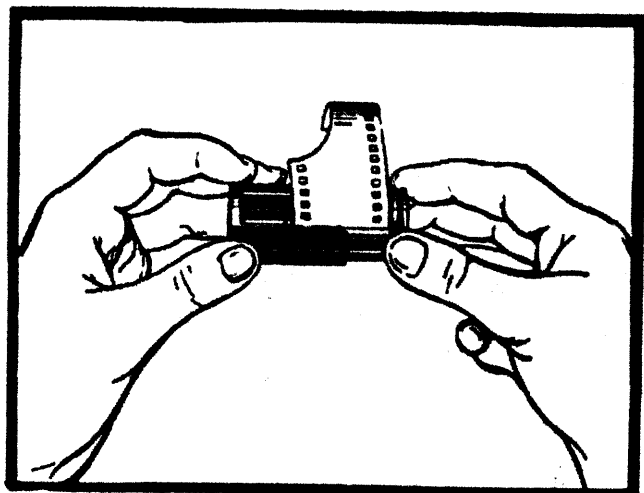


Fig. 8.

3. Loading the Camera

The camera may be loaded with film by usual (but not very bright!) lighting in the following way:

1. Open the camera and take the take-up spool out of it.
2. Having pulled not more than 10 cm of the loose end of the film out of the magazine, fasten it on the take-up spool under the spring (see Fig. 9) so that the first perforated opening of the film should be a little farther than the lug of the spring and pull the film backwards — the lug of the spring will get into the opening and hold the film. Set the lower

edge of the film at right angle to the spool axis, close to the flange.

3. Put the magazine into the camera so that the groove of the magazine block should mount onto the pin fixing the magazine in the camera and the magazine recess should be turned towards the camera back.

Mount the take-up spool simultaneously onto the hub and set the film so that the sprocket teeth should get into the film perforations (see Fig. 10). In order to do it, turn the head

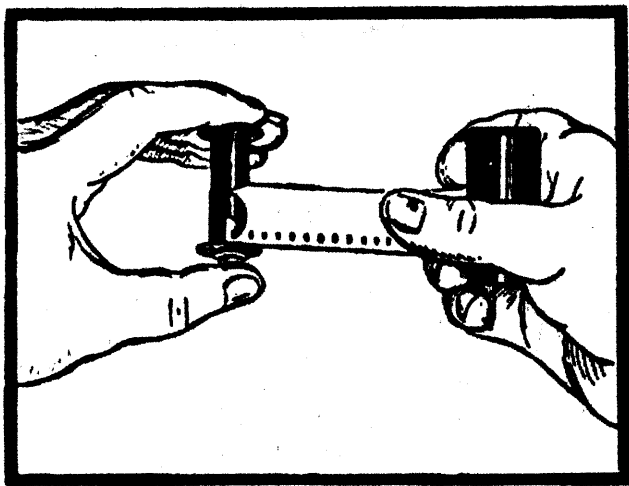


Fig. 9.

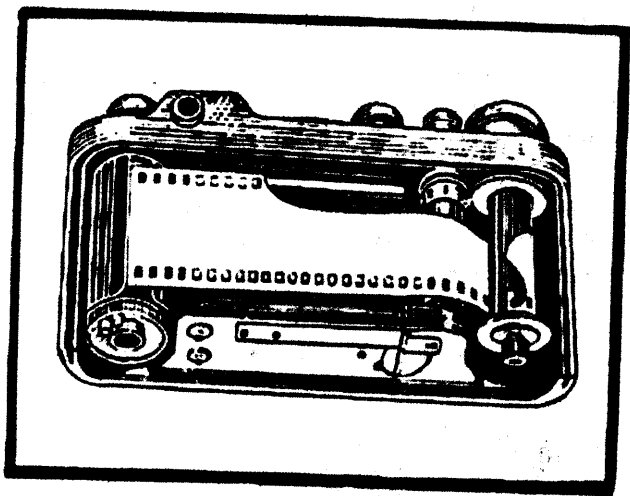


Fig. 10.

of the take-up spool in the direction of the forward take-up, holding the winding head of the shutter (2).

4. Close the camera. When the lock in the cover is turned, the magazine opens automatically and lets the film pass freely through its recess, without scratching the film.

5. For transporting unexposed film to the camera frame wind the shutter twice, pressing the release knob (19) after each winding. The winding head should be turned only in the direction of the arrow engraved on the head surface. For

winding the shutter turn the head as far as it will go, but without making excessive efforts.

If the camera is loaded correctly, the film must be transported by the mechanism smoothly and the rewinding head (15) must turn when the shutter is being wound.

6. Set the zero on the exposure counter scale limb (1) against the indicating sign (20) on the upper panel of the camera. The limb is coupled with the winding head by friction. For zero setting, turn the limb, pressing the button with a nail, against the direction shown by the arrow on the shutter winding head.

7. Bring the symbol meaning the type of film to the film speed number according to the data of the loaded film.

Do not hurry while loading the camera, do not make excessive efforts and keep strictly to the recommended sequence of operations — it will help you to acquire the necessary habit in the shortest possible time and it will save you possible errors.

If the loading has been unsuccessful and some perforations are torn, take the spool and the magazine out of the camera, cut off the film end with torn perforations, pull a 10 cm long end of film out of the magazine and repeat the procedure of loading in the order shown above.

4. Film Type Reminder

The film type reminder — the memory unit of the camera — consists of a fixed GOST speed scale and a rotating disk with conventional signs of the film types:



— daylight type colour film



— tungsten colour film



— black-and-white film



This device frees the amateur from the necessity of keeping in mind what film has been loaded into the camera and saves him inevitable errors.

In order to set the reminder, bring the film symbol to the speed mark, pressing the disk lugs (21) with your fingers and turning it.

Marks without figures correspond to GOST speeds 32; 65; 130 units.

5. Lens

«INDUSTAR-26-M» is a fast lens with non-reflection optics in a rigid (non-sliding) mount with the following scales on it:

- a) distances,
- b) diaphragm,
- c) depth of field.

Distance scale (5) serves for focusing the lens and for estimating the limits of sharpness. The number which is against the indicating mark (4) shows the distance in metres from the subject to the film plane (practically to the camera back).

If you know the distance to the subject, focus the lens by turning the focusing ring (13) till the necessary number and the indicating mark are brought into alignment.

If the distance to the subject is unknown, focus the lens by means of the range finder.

Diaphragm scale serves for changing the relative aperture of the lens. Stop the lens by turning the ring (11) till the number mark and the indicating dot (4) are brought into alignment.

The depth-of-field scale (12) is located on both sides from the indicating mark of the distance scale. The scale consists of two rows of numbers corresponding to the diaphragm scale of the lens (marks without numbers correspond to the diaphragm aperture 1 : 4). The distance shown by the indicator on the distance scale corresponds to maximum sharpness. The objects which are nearer or farther than the plane of sharpest focus will appear less and less sharply. Within some limits, however, this reduction of sharpness does not affect the quality of picture. The depth-of-field scale serves for finding these limits.

The depth-of-field scale shows on the distance scale the minimum and the maximum distance from the camera within which the sharpness of image will be satisfactory for each chosen diaphragm setting.

For instance, if the focusing distance is 4 metres (see Fig. 11) and the diaphragm, 16, the near limit of sharpness is 2 m from the camera, the far limit is infinity, if the diaphragm set is 5.6, the near limit of sharpness is 3 m, the far limit is

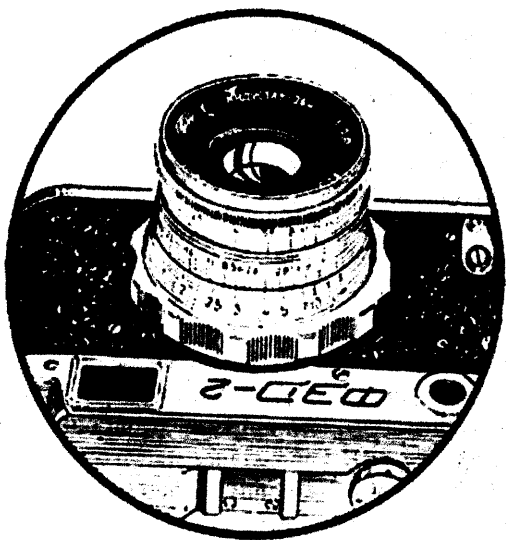


Fig. 11.

6.2 m aso. If the focusing distance is 7 m and the diaphragm 5.6, the near limit of sharpness is 4.2 m, the far limit is 20 m.

The depth-of-field scale gives the possibility of choosing the necessary diaphragm setting and the distance to the plane of sharpest focus in order to obtain the required depth of field.

For instance, if a landscape with a foreground is taken, focusing may be replaced by setting the lens according to the

depth-of-field scale. Bring the depth-of-field scale mark corresponding to the chosen diaphragm to the symbol ∞ (infinity). The second mark of the depth-of-field scale will show you where the near limit of sharpness is. All subjects within this limit will be sharp on the photograph.

On the forward nut of the lens mount (10) there is a connecting thread for fastening standard light filters with the thread 40.5×0.5 .

While selecting interchangeable lenses (a wide-angle lens, a telephoto lens a. o.) it is necessary to choose lenses with working distances equal to the value of the working distance of the main lens, stated in the camera data sheet.

However, it must be taken into account that each change of the main lens is connected with the necessity of subsequent adjustment of the lens to the camera.

6. Using the Range Finder

Focus the lens for shooting in the following way: observing through the eyepiece (22) of the view and range finder, focus the view finder by turning the dioptric focusing lever (14) according to your sight, till the maximum sharpness of the subject is reached.

If your sight deviates considerably from normal, use spectacles while shooting.

In the middle of the field observed in the view finder there will be seen a spot which differs in its colour from the general background. In this spot the observed subject is seen in

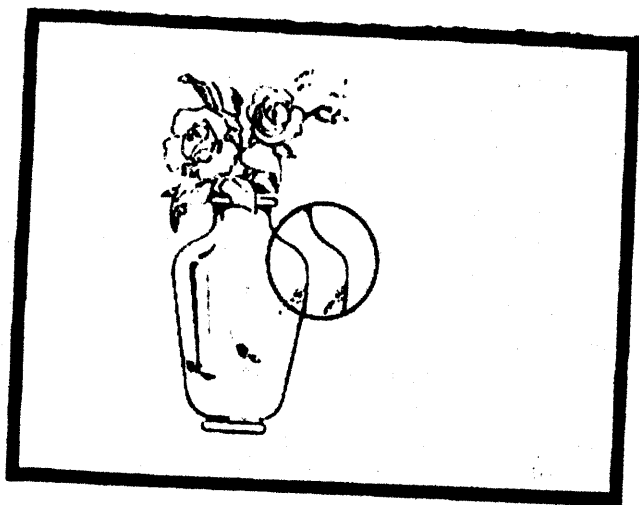


Fig. 12.

double image (Fig. 12). By turning the lens by the focusing ring (13) superpose the both images of the subject. In this case the lens will be focused exactly and it will form a sharp image of the subject on the film.

Try to focus approximately in the middle third of the light field, but not near the right and left sides. Besides, choose subjects having sharp outlines for focusing.

The view finder built into the range finder is designed for the main lens with focal length 5 cm.

When interchangeable lenses are used, focusing is ensured by the camera range finder, and the frame is chosen by means of interchangeable view finders fastened in the clamp (23) on the camera panel.

7. Setting the Shutter Speeds

The shutter speed scale is engraved on the shutter speed head. The automatical shutter speeds are given in parts of a second 1/30 : 1/60 : 1/125 : 1/250 : 1/500. The letter «B» means long manual shutter speed — when the release knob is pressed upon, the shutter opens and remains opened till the knob is let off.

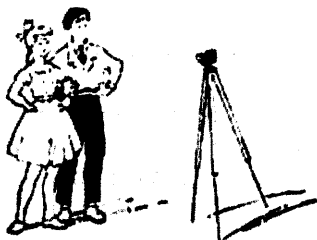
For setting the required shutter speed raise the shutter speed head a little, turn it till the corresponding scale point meets the indicator (17) and sink it.

8. Self-Timer

When shooting with the self-timer set the camera onto a tripod, focus the lens, wind the shutter and the self-timer.

For winding the self-timer turn its lever (8) counter clockwise from the lower position into the upper one. Then at the necessary moment press on the self-timer release knob (7) and take up the position you have planned for yourself beforehand. The shutter will be released in 9—15 sec after switching on the self-timer.

The shutter may be wound both when the self-timer is wound and when it is released. In order not to spoil the self-timer spring do not keep it in wound condition without need.



9. Shutter Synchronizer

If the lighting conditions are poor, there may arise a necessity of using powerful sources of light-flash lamps. The camera shutter is provided with a synchronizer which connects the moment of flash with the shutter release. The synchronizer is designed for the use of flash bulbs and multiflashes with inertia time within $0+1$ millisecond. The flash lamp is connected with the camera plug socket (9) by means of a special conductor with a terminal (Fig. 13). The flash reflector is usually fastened with a special cleat to the tripod bush of the camera or is set into the clamp of the camera (Fig. 13). The synchronizer of the $\Phi\Xi\Delta-2$ camera has an interlock device which disconnects the electric circuit while the shutter is being wound.

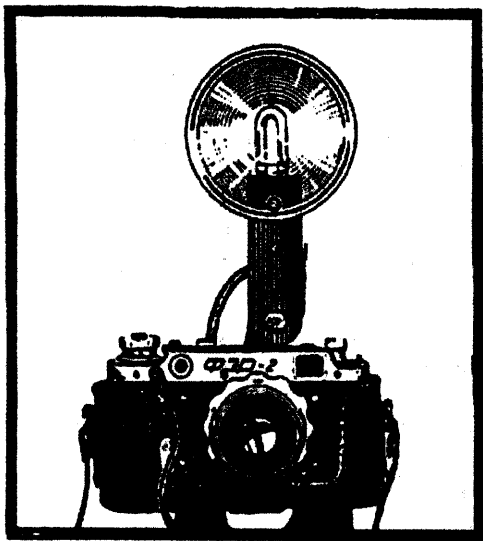


Fig. 13.

Shooting with flash lamps is possible only with shutter speed $1/30$ sec, for only at such speed the camera frame opens fully.

Shoot with flash lamps in accordance with the instructions enclosed with them.



10. Photography with ФЭД-2 Camera

While shooting always keep to a definite procedure in order to avoid errors. For shooting with a ФЭД-2 camera the following sequence of operations is recommended:

1. Open the case, take the cover off the lens. Screw in a light filter and put on the lens hood if necessary. If you are going to use a flash lamp, connect the lamp to the camera, check whether the connection of the terminal with the plug socket is tight.

2. Observing through the view and range finder eyepiece, select the camera view point position in order to obtain the desirable disposition of the image in the frame. By turning the lever of the dioptric focusing obtain the necessary sharpness of the image in the view finder.

Focus the lens.

3. Set the diaphragm depending on the required depth of field. If flash lamps are used, diaphragm setting is chosen depending on the distance to the subject and the film speed according to the instructions enclosed with flash lamps.

4. Wind the shutter by turning the winding head.

5. Depending on the film speed, the nature of the subject and its illumination, the diaphragm set and the light filter, estimate the exposure time.

6. Set the shutter speed head to the required speed. If you are going to use the self-timer, wind it.

7. Aim the camera at the subject, check the focusing,

choose the necessary moment and press the shutter or the self-timer release knob smoothly, without jerks.

If you hold the camera vertically, see to it that at the moment of shooting the case cover should not screen the lens.

Keep in mind the principles of successful photography:

a) Absolutely stable position of the camera at the moment of release.

b) Correct selection of the diaphragm set and exposure time.

The best way of exposure time estimation is the use of photographic exposure meters.



11. Unloading the Camera

When the camera works, the film is pulled out of the magazine and wound onto the take-up spool.

For overloading the film must be rewound into the magazine.

For rewinding the film switch out the shutter mechanism by pressing down the corrugated side of the switch hub (18) with the thumb of your right hand and turn the hub towards the letter «П» (rewinding). The switch hub must sink during this.

During the film rewinding the lens must be covered with its hood.

Raise the film rewinding head (15) and turn it in the direction of the arrow engraved on its face (Fig. 14).

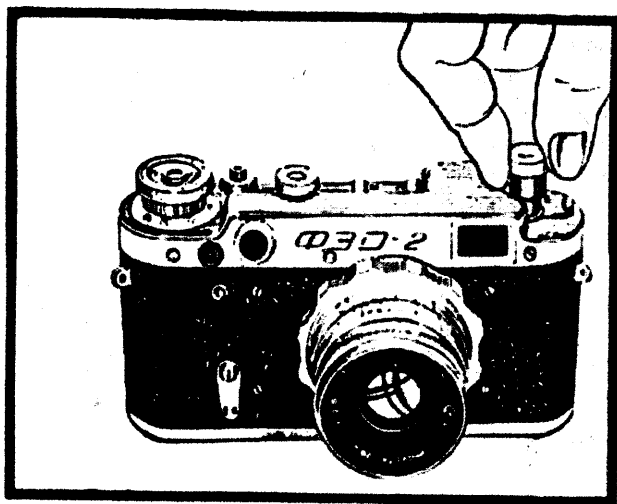


Fig. 14.

The end of the rewinding will be shown by the effort you will have to make to pull the film out of the take-up spool.

Open the camera, as was shown before and take out the magazine.



Turn the switch hub (18) into the home position, towards the letter «C» (shooting) as far as it will go (the hub must take up the upper

position) and wind the shutter. After this the camera can be loaded again.

Unload the magazine in full darkness or by the light which the colour sensitivity of the film permits.

IV. GENERAL RULES OF HANDLING THE CAMERA

For handling the camera correctly keep to the present instruction and also prevent the camera from dusting, staining and mechanical damages during the operation, carrying and keeping.

Do not take the camera out of the case without need. The case protects the camera against mechanical damages, shocks, pressure on the body and preserves the camera from dust. Dust penetrating into the camera causes the appearance of scratches on the film and wearing the camera down before time.

When taking the camera out of the case do not grasp it and pull by the shield protecting the range finder or by the control heads.

Take out the camera by the lower side of the lens mount (see Fig. 1). Do not make excessive efforts,— if the tripod bush is not screwed out fully, you may deform the camera.

Avoid touching the lenses of the view and range finder with your fingers. Take



special care of protecting the lenses of the objective from staining and dusting. It is necessary to keep in mind that each cleaning of optics in domestic conditions is a possibility of causing scratches.

Always keep the lens covered with the hood when it is not in use. If you employ the camera lens for projection printing, do not leave the lens in the enlarger — it will become dusty. On finishing the work screw it into the camera immediately. When screwing the lens into or out of the camera turn it by the focusing ring (13).

It is absolutely inadmissible to turn the lens by the diaphragm ring (11).

When screwing the lens into the camera set its mount by 1 m on the distance scale. Such setting makes screwing easier and, what is more important, preserves the range finder from possible disturbance of adjustment.

The lens must go into the camera quite loosely. Some slight effort should be made only for final tightening of the thread in order to preserve the lens from loosening spontaneously during focusing.



Do not expose the camera to sharp changes of temperature. In hard frost keep it under your overcoat and take out only for shooting. If the cold camera has been brought into a warm room, do not open the case in order to avoid misting. Special care should be taken to avoid wiping the optics or heating the camera artificially. Leave

the camera in the closed case and let it warm up to room temperature.

If you are setting the camera on a tripod, put a cardboard padding on the tripod screw — it will preserve the bottom cover from scratches.

Do not dismantle the camera and the lens. Unskilled dismantling without special tools and devices usually spoils the camera.

Correct cleaning of optical details from stains and dust is of great importance for their preservation.

V. GUARANTEES

The design of the camera and its manufacture ensure a period of many years of normal operation. Faults found by the purchaser during one year are repaired by the manufacturer free of charge.

Be sure to enclose the data sheet of the camera and the list of observed faults when sending a defective camera to the manufacturer.

Reclamations concerning to cameras which have been dismantled are not accepted.

Cameras should be sent to the manufacturer in complete set. The complete set is enumerated in the Data Sheet of the camera.

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THE ФЭД-2 CAMERA COMPLETE INCLUDES:

1. The camera 1 pc.
2. The "Industar-26M" lens 1 pc.
3. The twin metal magazine 1 pc.
4. The take-up spool 1 pc.
5. The protective lens cover 1 pc.
6. The case with sling and tripod nut 1 pc.
7. Brief Manual 1 pc.
8. Data Sheet 1 pc.