ARTICLE NSPU

(Index 1PN34)

TECHNICAL DESCRIPTION
AND SERVICE MANUAL

INTRODUCTION

The Technical Description and Service Manual is intended for personnel to familiarize themselves with the design and service requirements for the night weapon sight NSPU (index 1PN34).

The Technical Description includes application, specifications, components, layout, mounting, marking, and packing of the sight as well as the list of required tools and accessories

The Service Manual includes the safety requirements, set up before operation and how to operate, order and method of adjustments, failure modes and their causes and methods for correcting, and types of, scheduling of and order for preventive maintenance.

The Technical Description and Service Manual have appendices and figures at the end.

When getting familiar with the sight it is also necessary to reference the following documents:

— Storage Batteries 2НКБН-1.5 and 3НКБН-1.5 Operating Instructions.
— Manual for the weapon being mounted on.

T E C H N I C A L D E S C R I P T I O N

1. APPLICATION

The night sight NSPU (index 1PN34) is intended for aimed firing of the weapon as well as observation of the battlefield at night using natural illumination.

The sighting range (visibility) depends on the natural illumination, atmospheric transmittance, and target to background contrast.

2. SPECIFICATIONS

Main technical data are given in Table 1.

Table 1

Parameter	Rated Value
Magnification, min.	3.5x
Field of vision, degree, min.	5 (horizontal) 4 vertical
Exit pupil diameter, mm	5
Exit pupil range, mm	50
Range of sighting line adjustment:	
in elevation	±0.08
in azimuth	±0.05
Voltage of storage battery 2НКБН-1.5, V	2.5
Capacity of storage battery 2НКБН-1.5, Ah	1.5
Current drain, A	0.27
Number of charge/discharge cycles per battery	200
Mass of sight in combat position, kg	2.2
Mass of sight in travel position, kg	3.5
Mass of sight packed with individual STA kit, kg	8.1
Overall dimensions of sight, mm:	
length	495
height	191
width	96
Overall dimensions of packing case, mm:	
length	500
height	215
width	171

3. COMPONENTS AND STANDARD EQUIPMENT

The components and standard equipment are presented in Table 2.

Table 2

Designation	Description	Quantity
АЛ3.812.033	Article NCPU (without assy АЛ5.529.003)	1
	Individual STA Kit	
	Spare parts, pc	
АЛ5.529.003	Storage battery	3
АЛ5.883.030	Desiccant Beaker	1
АЛ6.548.035	Eye-shield	1
АЛ7.025.078	Ballistic cam SVD	1
-01	Ballistic cam AK74	1
-02	Ballistic cam PK	1
-03	Ballistic cam RPK	1
-04	Ballistic cam AKM	1
-05	Ballistic cam RPG-7	1
-06	Ballistic cam RPK-74	1
АЛ6.615.070	Lamp	4
	Tools and Accessories, pc	
	Bag	1
	Filter	1
	Diaphragm	1
	Belt	2
	Cassette (for lamp АЛ6.615.070)	1
	Wrench	1
	Napkin	2
	Storage, pc	
АЛ4.l61.237	Packing case	1
АЛ6.875.042	Case for ballistic cams	1
	Service Documents, copy	
	Technical Description and Service Manual	1
	Certificate	1
Г70.358.016 ИЭ	Storage batteries 2НКБН-1.5 and 3НКБН-1.5 Service Manual Operating Instructions	1

4. DESIGN AND OPERATION

4.1. General Overview of Night Vision Devices

The sight operation is based on the principle of electro—optical intensification of a target image brightness obtained by the sight at natural nighttime illumination levels on the terrain.

The terrain and all objects are illuminated with natural light radiated from stars, moon glow, etc.

Intensity of the illumination of the terrain produced by natural light is so low that observation of objects (targets) is difficult or impossible through ordinary optical devices. This problem is resolved by means of an electro—optical instrument that is composed of an objective, image converter, and an eyepiece that is used to view the intensified image on the image converter screen.

4.2. Image Converter

The image converter (EOP) is an electron—vacuum instrument and serves to intensify target images of low brightness projected on its photocathode up to the value that is sufficient for observation on the screen by the eye.
Fig. 2 illustrates the diagram of a two-stage image converter.

Constructionally, the image converter is made in the form of a cylindrical high vacuum glass bottle closed at the ends by glass plates.

The bottle is divided into three chambers. Each chamber represents single chamber EOP and consists of photocathode 1 sensitive to light, beams, focusing system, and screen 7 with photo luminescent compound. The focusing system consists of metal diaphragm attached on glass cone 5 and of sub-focusing electrode 8.

The image converter is fed with 30kV.

The objective projects an inverted image of the terrain or target of low brightness on the photocathode 1 of the image converter.

Light rays acting on the photocathode knock out electrons from it. The amount of electrons escaping from various parts of the photocathode is proportional to the amount of light in the image projected on by the object.

Under the action of high voltage the escaping electrons gain high velocity and fly to the positively charged screen.

The electrons escaping from any point of the photocathode are focused on a corresponding point on screen 7. That is why an inverted image from the photocathode is transferred to screen 7 by the electrons.

Screen 7 under the action of the electrons, phosphoresces in brightness proportional to the number of electrons and their velocity. In this way a correct image of the terrain and target is obtained on screen 7 of the first chamber.

The luminous image obtained on screen 7 of the first chamber is subsequently intensified by the second then the third chamber.

A correct (non-inverted) image of the terrain and target, of brightness sufficient for observation by the eye is thusly obtained on the screen of the third chamber.

The image of the terrain and target observed in the sight is of yellow-green color (the color of the phosphorescence of the third chamber screen).

4.3. Electro-Optical Circuit

The electro-optical circuit of the sight consists of an image converter L2 (Fig. 3), eyepiece, and projection system.

The objective, composed of lenses 1, 2, 3, and 4, projects an inverted image on the EOP photocathode. The projection system and lenses 3 and 4 of the objective, project reticle 10 image on the photocathode. Reticle 10 is illuminated with lamp Ll.

The projection system includes prism 14, lenses 11 and 13, prisms AP-90° and 12 and reticle 10. Prism 14 is glued on lens 2.

The image converter intensifies brightness of the target and reticle images and inverts them to provide a correct image on the screen with sufficient brightness to be seen with the eye.

The aiming indicators presented in Fig. 4 are marked on reticle 10. When shooting an RPG-7N1 (RPG-7DN1) with PG-7 and PG-7M grenades, or all other types of weapons, the upper row of indicators is used for aimed firing at a range of up to 300 m. The lines marked with the numeral 4 are used for firing at a range of 400 m and the lower lines at 500 m.

When firing PG-7L grenades, the upper row of indicators is used for aimed firing at a range of up to 150 m. The lines marked with the numeral 4 are used for firing at a range of 200 m and the lower lines at 300 m.

Screen is small in size and therefore it is viewed through the eyepiece, which consists of lenses 7 and 8 (fig. 3) cemented together.

A protective glass 6 is installed between the eyepiece and the image converter.

4.4. Elementary Circuit Diagram

The elementary circuit diagram is subdivided into the following units:

— voltage converter;
— h-v unit;
— voltage divider
— regulation unit
— supply circuit

4.4.1. The voltage converter is used for converting 2.5 V d.c. voltage from the storage battery B (fig. 5) into high a.c. voltage of 6 kV.

Conversion is carried out by a master oscillator on germanium transistors connected as a two-cycle circuit with the common emitter. The converter operation amounts to the following: Transistors T1 and T2 serve as switches to connect the storage battery E alternately to windings I and II. Supposing that transistor T2 is open at the moment, then the storage battery voltage (except for a low voltage drop in the section emitter-collector $U_{e\text{-}c}$) appears to be applied to collector winding I.

The current that produces magnetic flux in the transformer TP core and e.m.f. in the transformer windings will flow through winding I. With this e.m.f. of base winding IV will create negative potential relative to the emitter on transistor T1 base and e.m.f. of winding III in this moment will create positive potential on transistor T2 base relative to the emitter. Consequently, transistor T2 is locked at the moment when transistor T1 is opened.

When negative potential is available on the base, collector current of transistor T1 goes up. The current increase is determined by inductance and resistance of collector winding I. The process of current increase will be developed by avalanche as long as magnetic saturation of the transformer TP core occurs. The e.m.f. in the winding will go down. E.m.f. decrease causes decrease of the transistor T1 base and collector current. In turn decreases in currents in the transformer TP windings occur which cause decrease in magnetic flux. The flux goes down approaching zero and the e.m.f. in the windings changes its sign. Now, winding III produces negative potential relative to the emitter on transistor T2 base and winding IV — positive potential on transistor T1 base.

Transistor T2 is now opened and transistor T1 is closed and the above process is repeated.

The form of voltage oscillations in windings I and II is shown in Fig. 5. As it is seen from the figure, the converter oscillations are intermittent. This is due to capacitor C1 being introduced into the circuit. For the period of some oscillations capacitor C1 gets charged through emitter-base up to the value of transistor locking voltage, and then oscillations are ceased.

The pause in the master oscillator operation lasts as long as capacitor C1 gets discharged through reverse conductivity of the transistor junctions (collector—emitter and base—emitter junctions). The pauses in the master oscillator operation practically have no influence on the output voltage of the h-v unit, as the load current is very low.

Voltage rise is affected by h-v transformer TP.

Variable resistor R13 is used for tuning up the converter voltage to oscillations frequency, which should provide for stable voltage on the image converter screen.

4.4.2. The h-v unit is intended for rectifying and multiplying a.c. voltage of 6 kV of the voltage converter into d.c. voltage of 30 kV and it operates in the following manner:

If at some instant voltage Um is applied to the selenium rectifiers Д7 — Д 9 (Fig. 5) so that they are free to pass current, capacitor C3 will be charged up to the value of voltage Um equal to the amplitude value of the voltage of h-v winding VII of the transformer TP. In the next half-cycle under the action of the sum of the voltage on transformer TP winding VII and that on capacitor C3, capacitor C4 gets charged via rectifiers Д10 — Д 12 up to double the voltage 2Um. During the third half-cycle capacitor C5 will get charged via rectifiers Д13 — Д14 up to a voltage value which is an algebraic sum of the voltages across h-v winding VII of transformer TP (Um), across capacitor C3 (Um), and across capacitor C4 (2UM), i.e. up to 2Um. During the fourth half-cycle capacitor C6 gets charged through rectifier Д53 — Д16 up to 2Um, etc.

The voltage across the h-v unit output is a sum of the voltages across capacitors C4, C6 and C8, i.e. about 6 Um.

The above given description of the h-v unit operation is simplified and holds for the ideal case when there are no current losses and leaks in high-voltage transformer unit T_p.

In fact, it's necessary to bring 6 kV from the voltage converter in order to obtain output 30 kV from the h-v unit.

4.4.3. The voltage divider - Voltage across h-v lead —in 6 (Fig. 2) of the image converter from photocathode 1 to the screen of the third chamber is distributed as 0-10-20-30 kV. The divider distributes voltage in the EOP chambers and has resistors R14 — R22 (Fig. 5) in its circuit.

Voltage to h-v electrodes is supplied from resistors R16, Rl9, and R22 and to the sub—focusing electrodes from resistors R15, R18, and R21.

Resistors R14, R12, and R20 are used for protection of the image converter failing from sudden bursts of light from gun blasts and shell bursts.

4.4.4. The Regulation Unit - Automatic stabilization of the EOP screen brightness and reticle illumination intensity at various levels of natural night illumination intensity is used to provide for maximum convenience in observation through the sight.

The regulation unit consists of two automatic control circuits: one for output voltage, the VPN*, and the other for reticle brightness.

The VPN voltage regulation circuit is a d.c. amplifier on transistors T3, T4, and T6. The amplifier supply voltage is taken from transformer winding V and is rectified by bridge Д 3 — Д 6.

The input signal is provided with photoresistor Φ_p, placed after the EOP screen. The value of Φ_p resistance varies depending on the brightness of the EOP screen. At low illumination intensity on the ground and, consequently, at low screen brightness the amplifier input current practically equals 0, transistor T6 is locked and the regulation unit has no influence on the operation of the sight circuit.

With the increase of illumination intensity, the value of Φ_p resistance goes down and transistor T6 is opened.

The output of the circuit for automatic voltage control VPN is connected to feedback capacitor C1.

Capacitor C1 gets charged from rectifier Д 3 — Д 6 via the emitter-collector junction of transistor T6 and locks transistors T1 and T2. As a result, the output voltage value

* Here and hereinafter the voltage converter and h-v unit are referred to as the VPN.

goes down. The circuit of the reticle brightness regulation is made in the form of a d.c. amplifier wired on transistors T5 and T7.

The amplifier is fed from the 2.5V storage battery.

The charge accumulated across the capacitor C2 depends on the value of the voltage of transformer VI winding. Capacitor C2 voltage produces the amplifier input signal and controls the value of transistor T5 collector current. At low illumination intensity on the ground, the lamp H1 voltage (reticle brightness) is minimized.

With increase in illumination intensity, brightness of the reticle increases.

The required initial level of reticle brightness is set by the variable resistor R8 with the knob on the outside of the sight body. Reference positions are shown in Fig. 13.

4.4.5. The storage battery Б 1.5 Ah (Fig. 5) is used as a supply source for the sight. The operating time of the sight before replacement of the supply source is needed is typically 5.5 hours. The operation time is reduced at lowered ambient temperatures.

The sight is switched on by microswitch B that is engaged with resistor R8 knob.

4.5. Design

The sight consists of the following main units and mechanisms:

— body 3 (fig. 7);
— adjusting mechanism 60;
— converter 46;
— voltage converter 13;
— regulation unit 27;
— h-v unit 59;
— storage battery 28;
— diaphragm (Fig. 15);
— filter (Fig. 17).

Metal body 3 (Fig. 7) contains the main units and parts and serves as the sight base.

The objective lenses are secured in body 3. Lenses 43 and 45 are held in mounts 42 and 44 with diaphragm openings intended to lessen influence of dissipated light, which deteriorates the quality of the target. Mounts 42 and 44 are fixed in the general frame, which is screwed into body 3 and locked with screws 34.

Lens 40 with the prism is attached in mounts 39 and 41, which are secured in body 3 with screws 38 and 62. Lens 37 is secured in body 3 with ring 37, which is stopped with screws 36. Lens 61 in its mount is screwed in body 3. Converter 46 is inserted into body 3 and pressed against by cover 47. Shock absorber 48 is installed between cover 47 and converter 46.

Cover 47 is attached to body 3 with screws 1. Mount 53 is screwed in cover 47 and locked in place with ring 52. Lens 56 is inserted into mount 49, which secures lens 55 in mount 53 via ring 50. Eye shield (rubber eye cup) 54 is clamped on the lug of cover 47 using clamp 51.

Provided in the ocular part of the sight is a port for desiccation of the unit closed by a screw closure composed of cap 18 and cover 16, with rubber gasket 17 between them. The port is used for desiccation of the inner cavity of the sight with dry air or nitrogen. When purging with air or nitrogen into the sight, escape is through the hole provide with plug 7 and its rubber gasket.

While in service, the air inside the sight is continuously dried by silica gel in desiccator 15. Unsaturated silica gel is blue in color. As silica gel becomes saturated by moisture its color changes to pale pink, or at full saturation, dirty white. The silica gel color can be seen through the glass in desiccator 15.

H-v unit 59 is attached to cover 47 with screws2. The lower compartment of body 3 contains voltage converter 13 and regulation unit 27 secured by screws 12.

Voltage converter 13 is connected with h-v unit 59 by means of cable 14. The output voltage of h-v unit 59 is measured through the hole provide in cover 47 that is closed by screw cap 57 and its associated gasket and washer. Gasket 58 is used to pack the inner cavity of the sight.

Adjusting mechanism 60 is attached to body 3 from the left with screws 4 and pins 5. Lamp Л1 is supplied through wire 6 and contact 12 (Fig. 8). Washer 11 is used as an insulator. Special compartment with cover 21 for storage battery 28 is part of body 3 (Fig. 7). Cover 21 is secured by catch 20, which is attached to cover 47 by means of screw cap 18.

The inner walls of the battery compartment are coated with epoxy varnish that is resistant to alkalis. Contacts 1 (Fig. 20) of the storage battery 28 (Fig. 7) engage contact springs 32 and 29. Contact spring 32 is secured in body 3, and spring 29 is secured in post 30 with screws 33. Block 31 isolates contact spring 29 from the sight body.

Soldered to post 30 is the wire that feeds negative voltage to microswitch B (Fig. 13). Positive voltage is fed to the sight body via contact spring 32 (Fig. 7).

The sight is held on the weapon by means of the clamping device, which consists of bracket 22, clamping screw 23, catch 25, and handles 26 and 24.

5. DESIGN AND OPERATION OF COMPONENT PARTS

5.1. Adjusting Mechanism

The adjusting mechanism is used to elevate the sight and to adjust it for azimuth and elevation. The mechanism is located in casing 31 (Fig. 8). Reticle 14 and prism 15 are screwed in guide 17 through strap 13. Lens 29 is screwed in casing 31 and secured with a setscrew. Prism AP-90° 28 and dog 27 are secured in guide 6. Spring 5 presses dog 27 against guide 1, ЛЕВ, СТП, ПРАВ or LEFT MSP RIGHT (MSP = Mean Sighting Point). One end of spring 5 is secured in guide 6 and the other in bushing 3. When turning guide 1, guide 6 with prism AP-90º 28 rotates and the reticle image in the field of vision shifts to the left or right relative to the sight's optical axis; thus azimuth adjustment of the sight is effected.

The azimuth scale marked on nut 2 is divided into 30 divisions with each division equal to 00.5 moa. The index mark for the azimuth scale is found on guide 1. Each turn of guide 1 for one division is fixed by stop 4 under action of the spring. The corresponding direction to turn guide 1 to shift the mean point of impact to the left or right is marked on case 31 as ЛЕВ, ПРАВ or LEFT/RIGHT (i.e. turning the guide in the direction labeled ПРАВ or RIGHT moves the point of impact right).

Scale (cam) 21 adjusts the up and down angle for set distances designated by the numbers 4 — 10 which correspond to detents in the ballistic cam. Adjustment of the point of impact between for amounts between these set distances is accomplished by loosening the screws 22 by one or two revolutions then turning the knob without moving the cam. The RPG-7 cam is used for temperature corrections with the signs "+" and "—"indicating warm and cold respectively. Scale (cam) 21 is linked to knob 23 and screw 20 by compression friction when screws 22 are tight. Screw 20 and scale (cam) 21 rotate when knob 23 is turned. Screw 20 rotates between the bottom surface of case 31 and nut 19. Each turn of knob 23 for 1 division of scale 21 is fixed by stop 32 acted on by spring 33. The upper end of scale (cam) 21 has grooves 31. The index mark for scale (cam) 21 is located on the lug on case 31.

When turning knob 23, ВВЕРХ СТП, ВНИЗ or UP MSP DOWN, and screw 20, guide 17 moves along key 26 together with prism 15 and reticle 14, i.e. the reticle image shifts up or down in the field of vision relative to the sight's optical axis — screws 22 are loosened 1 - 2 trims to fine adjust the angle of sight elevation. When

screws 22 are loosened 1- 2 turns, knob 23 and screw 20 move independently from scale (cam) 21. The elevation scale graduated in 00.5 moa is marked on knob 23 and the corresponding index mark is on scale (cam) 21. The direction of movement of prism guide 17 that corresponds to the same shift in mean point of impact is marked in the end face of knob 23, ВВЕРХ, ВНИЗ or UP/DOWN (i.e. turning knob 23 in the direction labeled ВВЕРХ or UP moves the point of impact up).

Spring 17 takes up the play in guide 17 on key 26, which is locked in position by screw 30 and pins 34.

Limiters 24 and 25 coupled with screw 20 and case 31 by means of pins 18 are used to limit the adjustment range and protect the mechanism against damage.

Lamp Л11 is screwed into casing 7 which is attached to casing 31 opposite to knob 23 by four screws.

5.2. Converter

Between the image converter Л 12, hereinafter referred to as EOP (Fig. 9) and casing 1 and cap 3 is poured elastic compound (rubber).

Diaphragm 4 is positioned between the screen and cap 3.

Divider 4 (Fig. 11) is composed of a group of resistors, R15-R22 (Fig. 10) molded with epoxy compound to form a single block. Resistor R14 is molded into casing 1 (Fig. 9).

To supply voltage to the EOP chambers, the divider is mounted with contacts 7 and 8 (Fig. 10), which have caps 6 and 4.

The h-v unit voltage is supplied to the divider through contact 5. Divider 4 (Fig. 11) is attached to casing 1 (Fig. 9) with screw 12 (Fig. 11) and contact 14. Divider 4 is connected with converter 3 through bushing 3 (Fig. 10) and contact bar 5 (Fig. 9). One wire from resistor R15 (Fig. 10) is soldered to bushing 3. Contact 2 (Fig. 2) of photocathode 1 is connected with divider bushing 3 (Fig. 10) through resistor 14 (Fig. 9), contact bar 5, and screw 12 (Fig. 11). The second wire from resistor R15 (Fig. 10) is soldered to contact 7 (Fig. 9) on the sub-focusing lead of the image converter. Resistor R17 lead is soldered to contact 8 (Fig. 10) on the screen lead of the EOP first chamber.

Converter 3 (Fig. 11) and divider 4 are located in casing 2 which together with protective glass 6 allow for insulation of the image converter from the metal parts of the sight. Casing 2 is closed with screen 1, protecting the image converter from

electromagnetic interference. Divider 4 contacts are put on the respective h-v lead-ins of converter 3. Shock absorber 5 is laid between converter 3 and casing 2.

Protective glass 6 and photoresistor 7 are secured in casing 2 by means of ring 8. Screen 1 and casing 2 are attached to casing 1 (Fig. 9) with screws 15 (Fig. 11).

Converter 46 (Fig. 7) is connected to casing 3 via contact 8 and spring 9.

5.3. Voltage Converter

The voltage converter is composed of body 2 (Fig. 12), stack 6 of the magnetic circuit, collector coil 3, base coil 1, h-v coil forming the transformer TP, and radio elements. Transistors T1 and T2 and capacitor C1 are glued in the seats in body 2. Resistor R13 is screwed to body 2. The wires are soldered to pins 4.

The voltage converter contact is connected to contact 7 through which the h-v block is supplied.

5.4. Regulation Unit

The regulation is used to switch the sight on and off, to set the required initial brightness of the reticle lamp, and to automatically maintain the screen and reticle brightness at various levels of external illumination.

Resistor R8 is positioned on plate 12 (Fig. 13) attached to cover 1 with screws 14. Microswitch B and pusher 11 are secured on post 10 with screws 9. Post 10 is held to cover 1 with screws 15. The other end of pusher 11 is in contact with the lower end of cap 7.

Knob 2, ЯРКОСТЬ СЕТКИ, ВЫКЛ or RETICLE BRIGHTNESS, OFF, is coupled to cap 7 by means of screws 6. The movable part of resistor R8 is connected to cap 7 via bushing 3, ring 4, and cotter pin 5.

When the sight is in the off-position, pusher 11's end engages the recess on the end of cap 7. When knob 2 is turned clockwise, pusher 11 presses the microswitch B making contact and switching on the sight. Further turning of knob 2 clockwise is used to set the brightness of the reticle lamp.

When knob 2 is turned such that the arrow points at the indicator mark ВЫКЛ or OFF, pusher 11's end enters the recess in cap 7's end face, releases microswitch B, and switches the sight off. In the extreme end positions, knob 2 is limited in turning by the lug on the end face of cap7 and plate 12. Knob 2 is locked in position by stop 8 and end cap 7.

5.5. H-V Block

The h-v block is composed of selenium rectifiers Д 7 — Д 20 (Fig. 14) connected in series (2 or 3 per each arm), and capacitors C3 — C8. The selenium rectifiers and capacitors are held in posts made of an epoxy compound.

All elements of the h-v block are molded with an epoxy compound forming a single unit.

For measuring high voltage, there is a hole with contact 4 that is closed by plug 57 (Fig. 7) and gasket 58. Contact 3 (Fig. 14) is connected to contact 10 (Fig. 7). Connection to the casing is carried out via contact 10 with spring 11.

5.6. Storage Battery

The storage battery is composed of batteries Б (Fig. 20) and two contacts 1 made in the form of rustproof bushings.

5.7. Diaphragm

The amount of light entering the sight is limited and controlled by the iris diaphragm and tow neutral light filters.

Filter 1 (Fig. 15) is screwed in casing 2. Filter 11 is glued in mount 3. Casing 2 is mated with mount 3 via ring 9 and o-ring 10. Mount 3 is attached to casing 6 with screws 8. The iris diaphragm, composed of blades 12, is positioned between the filters.

On the end face of casing 6 are inscribed ОТКР or OPEN and ЗАКР or CLOSE, which correspond to the open and closed positions of the iris diaphragm.

When casing 2 is rotated, the motion is transferred to blades 12. With this, the light aperture opening increases or decreases (depending on which direction casing 2 is rotated) and thusly the iris aperture is regulated.

To prevent spontaneous opening or closing of the diaphragm, stop 5 with spring 4 is included in casing 2. The stop engages the teeth inside casing 2.

To limit the rotation of casing 2 and thereby limit the amount the iris aperture can be changed, the toothed surface inside casing 2 is limited to an angle of 90º.

The diaphragm is attached to the sight by engaging the slots of casing 6 with the lugs on body 3 (Fig. 7). Clamp 7 (Fig. 15) produces tension between the arms of the slots of casing 6 and body 3 lugs (Fig. 7).

5.8. Filter

Filter 3 (Fig. 17) is glued in mount 2.

Filter 13 (Fig. 1) is attached is attached to body 3 (Fig. 7) using the lugs in the same manner as diaphragm 1 (Fig. 18). Springs 1 (Fig. 17) produce tension between the arms of the slots of mount 2 and body 3 lugs (Fig. 7).

6. TOOLS AND ACCESSORIES

Wrench 5 (Fig. 1) is used for adjusting and checking screws 10 (Fig. 18), for removing and installing desiccators, for removing and installing plug 7 (Fig. 7) when purging with air or nitrogen, and for replacing the lamp, and for turning guide 11 (Figure 18).

Diaphragm 6 (Fig. 1) is used when adjusting the sight during daytime or twilight.

Filter 13 is used to increase contrast of the target image when observed against a green background during elevated levels of illumination intensity.

Case 11 is used to store the batteries.

The straps 12 are used to attach the carry bag with the sight to the harness of a paratrooper. They are passed through web loops on the back of the bag, and through the fastening rings of the reserve parachute. The snap hooks on the straps are fastened to the rings on the straps.

Magazine 16 is used for storing lamps.

Wipe (napkin) 3 is used for cleaning the optical surfaces.

7. ATTACHMENT OF THE SIGHT TO THE WEAPON

The sight can be mounted on a variety of weapons. A special mounting plate of dovetail design is provided for this purpose. When mounting the sight, fit the slot of the sight clamping device onto the dovetail on the weapon mounting plate from the rear, slide it forward, and clamp in place by turning the handle 5 (Fig. 18) forward until the lug engages the sight mount plate. To remove the sight, disengage the lug and rotate handle 5 backwards, then slide the sight off the mount plate rearward.

The sight should be tightly held on the weapon mount plate.

To adjust the sight clamping device, remove catch 6 and the adjustment handle 5. Move handle 5 a number of teeth on the adjustment shaft f (clockwise if the clamp needs to be tightened on the mount or counter-clockwise if it needs to be loosened) then move handle 5 to the unclamped position and reinstall catch 6. Adjust until the sight is firmly fastened on the mount plate when handle 5 is forward and the lug engages the sight mount plate.

8. STORAGE AND TRANSPORTATION

When transporting, the sight, without the battery installed and diaphragm installed, is packed in case 1 (Fig. 19).

The individual STA kit is packed in the case per the packing list attaché to the inside of the case cover. The packing case is used for transporting and storing the sight and the individual STA kit. The sight 2 (Fig. 19) is held in place in the case by means of two metal clamping straps and corresponding hooks.

The battery storage case 11 (Fig. 1) is held in the bottom of the sight case by a spring metal strap.

Bag 4 is intended for carrying the sight in the field.

Wrench 5 is put in the inner pocket of the bag; a storage battery(s) 10 in one outer pocket; and filter 13, magazine 16 with lamps 15, and napkin 3 in the other outer pocket.

If the diaphragm is not in use during operation of the sight, it is put in the bag.

The Inspection Certificate, Operating Instructions for storage batteries 2НКБН-1.5 and 3НКБН-1.5, and Technical Description and Service Manual for the sight are located in a metal pocket at the back right corner of the packing case.

9. MARKING

The sight marking is found on cover 7 (Fig. 18). It includes the sight designation and serial number.

These are also marked on the front of the packing case.

10. SAFETY RULES

In order to insure safe and faultless operation of the sight it is prohibited for the operator:

- to dismantle the sight;
- to switch on the sight in the daytime with the objective diaphragm open (Remember that day light will cause failure of the sight.);
- to adjust the reticle lamp to maximum brightness;
- to leave the sight in the on-position when not in use or in storage;
- to apply excessive force when operating the knobs for adjusting azimuth and elevation; or the knob for regulating brightness of the reticle;
- to touch the optical elements of the sight with bare hands (dust and dirt is removed with a clean flannel wipe only);
- to turn the sight on in the bag or packing case;
- to use batteries other than 2НКБН-1.5;
- to leave the storage battery in the sight when the sight is not in use (the batteries should be stored in their case).

The operator when using the sight must do the following:

- Move the sight to the side away from any bright source that appears and switch the sight off if the source continues to be bright;
- Become familiar with the layout and mounting, of the sight and method of packing it in the packing case;
- Insure that the sight is properly packed in the case or bag, or properly affixed to the weapon;
- Protect the sight from shocks while in use and during transportation.

The batteries for the sight are supplied without the electrolyte installed. One of the batteries is to be charged immediately on receipt of the sight by the unit and kept charged. The other two batteries can be charged as early as one month prior to use of the sight in combat or training.

The batteries are to be charged in compliance with the instructions in Г70.358.016 ИЭ, which is supplied with the sight.

11.TECHNICAL INSPECTION

Trouble-free operation, combat readiness, and the service life of the sight are dependent to a great extent on regular check-ups and maintenance for the sight.

Perform the technical inspection at the scheduled intervals. It should be performed during all maintenance procedures with the purpose of determining operability of the sight, and to uncover any problems and allow them to be remedied.

When inspecting the sight it is necessary:

— to check the standard equipment against the list given in the packing list attached to the inside cover of the packing case;
— to perform an external inspection of the sight and its parts (there should not be any cracks, dents, traces of corrosion, or other defects on the external surfaces);
— to check the sight for correct and reliable mounting on the weapon (sight wobble is not permitted when handle 24, Fig. 7 is turned forward up to full engagement of the lug with bracket 22);
— to inspect the optical surfaces to insure there are no cracks, oil deposits, dirt, or other contaminants on the lenses of the objective and eyepiece;
— to check that plug 57 with gasket 58 for h-v lead, and the rubber gaskets for desiccator 15 and cover 16 are present;
— to check that cover 16 is tightened properly;
— to check the condition of the desiccant (unsaturated silica gel should be bluish in color);
— to check for proper tightening of the screw caps on the storage batteries (electrolyte should not come out when the battery is turned upside down);
— To check the contacts for the battery in the sight and contact 1 (Fig. 20) of the batteries their selves (there should be no oxidation or salt deposits on the contacts);
— to measure the voltage on each battery (if it is less than2.5 V, have the battery charged); ,
— to install one of the operable batteries in the sight;

CAUTION: Prior to installation of the battery in the sight, make sure that the diaphragm is closed and knob 4 (Fig. 18) is in the off-position.

— to switch the sight on with the diaphragm closed by turning knob 4 clockwise (the field of view should glow when seen through the eyepiece, i.e. individual point of light should be seen on the dark background of the EOP);
— to check the reticle illumination;

— to test the alignment mechanism (the knob ВВЕРХ СТП, ВНИЗ or UP MSP DOWN, should turn smoothly without any jerks or jamming and the aiming marks should move in the field of vision);
— to set the scale for knob 8 to the first division by turning knob 8;
— to switch off the sight;
— to remove the storage battery;
— to install and check each spare battery in turn switching each on for at least 2 minutes and checking the reticle glow;
— to switch off the sight after the last battery is checked;
— to remove the last battery checked;
— to remove the diaphragm 1 from the sight and check it for operation (the diaphragm should open the aperture fully*);
— to check condition of the spare desiccator.

12. PREPARING FOR OPERATION

12.1. Preparing for Carrying in the Field

To prepare the sight for carrying in the field from being transported, carry out the following in order:

— Open the packing case cover;
— Take out the sight with the diaphragm attached;
— Take out the bag with the accessories;
— Put the bag on the left shoulder;
— Place the sight in the bag;
— Take a storage battery out of the case and put it in one of the bag pockets and put the filter in the other bag pocket.

12.2. Changing to Firing Position

For changing from carrying to firing position it is necessary to:

— Choose a place to fire from and occupy it;
— Remove the sight from the bag;
— Install the sight on the weapon by taking the weapon by the fore grip, aligning the clamp slot of the sight with the mount dovetail on the weapon, moving the sight forward up to the stop and locking the sight in place by turning the handle of the clamping device until its lug engages the sight mount;
— Remove the storage battery from the bag pocket and install it in the sight;

* With the diaphragm closed, the aperture diameter should be a maximum of 6 mm.

— Remove the diaphragm, if it is not needed, put it in the bag, and switch the sight on;
— Put on the filter, if needed.

12.3. Sight Adjustment on Assault Rifles, Machine Guns, and Sniper Rifles

To adjust the night sight for use on the weapon, proceed as follows:

— Carry out the technical inspection described in section 11 of this manual;
— Check the aiming devices (optical and mechanical sights) per the service manual for the weapon being mounted on;
— Install the weapon on the aiming rest to check the sights;
— Zero the weapons using the mechanical sights.
— Install the night sight on the weapon and lock it in position;

Adjust the sight. The adjustment is carried out during the daytime or at twilight as follows:

— Set the sight leaf on the weapon to position 4;
— Aim the weapon with the use of the mechanical sights at an aiming point at 100 m distance (use the same target used to zero the weapon with the mechanical sights);
— Set the Scale or ballistic cam 9 (Fig. 18) to division 3 for AKMs or RPKs or 4 for AK74s, PKMS, RPK74s or SVDs by rotating knob 23 away from yourself up to the stop;
— Make sure that the diaphragm on the scope is closed;
— Switch the sight on;
— Determine the optimum brightness for the reticle and the visibility of the aiming point by turning knob 4 and body 2 (Fig. 15) on the diaphragm while looking through the sight;
— Check that the vertex of the scope reticle coincides with the aiming point from the mechanical sights;
— If the aiming point and the reticle vertex fail to coincide, loosen screws 10 (Fig. 18) between one and two turns each using wrench 5 (Fig. 1), bring the reticle vertex into coincidence with the aiming point by turning knob 8 for vertical adjustment and guide 11 for horizontal adjustment. Note: scale 9 (the ballistic cam) must be held in place by hand to prevent it shifting from its position while turning knob 8;
— Tighten screws 10;
— Remove the weapon with the scope from the aiming stand;
— Aim carefully and take four single shots at the aiming point using the scope;

— Determine the spread and the mean impact point of the shots.

Normal accuracy is recognized when three out of four with one flier go in a circle of 8 cm diameter for the SVD or 15 cm for other weapons. If the spread of the hits does not fall in these requirements, repeat firing.

If the result of the repeat firing is not satisfactory, send the weapon and the scope to the repair shop for diagnosis and elimination of the bullet scattering problem.

If the spread of the hits is normal, the commander determines the mean impact point of the hits and its relation to the control point. The control point for firing with the scope is positioned above the aiming point. For the RPK74s this point is 16 cm above the aim point; for AK74s — 20 cm; for AKMS and RPKs — 21 cm; for PKMs — 22 cm; and for SVD sniper rifles — 23 cm above the aim point.

To be zeroed, the mean impact point must not deflect from the control point by more than 3 cm for the SVD or more than 5 cm for the other weapons.

If all of the hits do not fall in the specified diameter circle, for the weapon the mean impact point is determined from the best 3 shot group with the condition that the fourth hit must be positioned at least 2.5 radii from the circle containing the 3 shot group.

If the mean impact point does is further than the required distance from the control point, it is necessary to make adjustments in the following order:

— If the mean impact point is up or down from the control point, loosen screws 10 (Fig. 18) between one and two turns each using wrench 5 (Fig. 1), and turn the adjustment knob 8 in the direction of the pointer labeled ВВЕРХ or UP if the mean impact point is lower than the control point, in the direction of the pointer labeled
— ВНИЗ or DOWN if the mean impact point is higher than the control point. Rotation of knob 8 through one division moves the point of impact approximately 5 cm at a target distance of 100 m. Be sure that the ballistic cam, Scale 9, does not rotate when turning the adjustment knob 8.
— If the mean impact point is to the right or left of the control point, turn screw for guide 11 in the direction of the pointer labeled ПРАВ or RIGHT if the mean impact point is to the left of the control point or in the direction of the pointer labeled ЛЕВ or LEFT if the mean impact point is to the right of the control point. Rotation of screw for guide 11 through one division moves the point of impact approximately 5 cm at a target distance of 100 m.
— Tighten the screws 10 (Fig. 18) until snug;

— Test fire the weapon and scope again to determine if the adjustments were correct.

Adjustment of the scope at night is performed in basically the same way. In this case it is necessary to illuminate the target and the mechanical sights with light sources to aim the weapon at the target with the mechanical sights, during which the scope must be switched off. It is also not necessary to use the diaphragm when sighting in the scope at night.

12.4. Sight Adjustment on Grenade Launchers

To adjust the night sight for use on the weapon, proceed as follows:

— Carry out the technical inspection described in section 11 of this manual;
— Check the aiming devices (optical and mechanical sights) per the service manual for the weapon being mounted on;
— Install the weapon on the aiming rest to check the sights;
— Install the night sight on the weapon and lock it in position;
— Adjust the sight.

The adjustment is carried out during the daytime or at twilight using the sighting template and bore-sighting instrument.

When adjusting the sight using the template, use the same template used for adjusting optical and mechanical sights with the addition of a circle with cross hairs, 80 mm in diameter, as is shown in Fig. 6.

The adjustment is performed as follows:

— Set scale 9 (Fig. 18) with position + at the indicator mark on the
— sight body;
— Perform bore sighting using the instrument cross hairs and the upper cross hairs on the sighting template.
— Insure that the sight diaphragm is closed;
— Switch the sight on;
— Determine the optimum brightness for the reticle and the visibility of the template by turning knob 4 and body 2 (Fig. 15) on the diaphragm while looking through the sight;
— Check the alignment of the vertex of the reticle aiming angle with the center of the lower circle cross hairs;
— If the vertex of the reticle aiming angle is not coincident with the center of the cross hairs, loosen screws 10 (Fig. 18) between one and two turns each using

wrench 5 (Fig. 1), and align the vertex of the reticle aiming angle with the center of the lower circle cross hairs by turning knob 8 for vertical adjustment and guide 11 for horizontal adjustment. Hold scale 9 by hand to prevent it shifting;

— Tighten screws 10;
— Turn off sight*;
— Install the weapon on the aiming rest to check the sights;
— Install an adjusted optical sight on the weapon and sight on a remote point (top of pole, corner of building, etc.) at a minimum, range of 300 m from the weapon;
— Set the knob for temperature corrections to the "+" position;
— Adjust looking through the optical sight so that the cross hairs of the range scale marked with numeral 3, lie on the edge of the remote point;
— Remove the optical sight from the weapon without disturbing the weapon's position;
— Install the night sight on the weapon without disturbing the weapon's position and set knob 8 with scale 9 to "+";
— Switch the sight on.
— Looking through the sight, make sure that the aiming angle coincides with the chosen remote point in azimuth and elevation.

If the angle is offset in any direction, it is necessary to align it with the chosen point in azimuth and elevation.

After adjustment:

— Switch off the sight;
— Set scale 9 to position "+" if ambient temperature is warm or in position "-" if ambient temperature is cold, using knob 8.

* When adjusting using a remote sighting point, the possible error may be equal to between 0.005 And 0.01 MOA. Therefore, adjustment by this method should only be used when it is not possible to adjust using the aiming template.

13. OPERATING WITH THE SIGHT

13.1. General Directions

To improve on the ability to use the night sight for firing at targets and for observing the battlefield, it is recommended to become familiar with the terrain in the daytime, if possible.

Successful use of the sight for firing at targets and observation of the battlefield is very much a matter of experience since image contrast and color of the terrain and targets as observed through the night sight differ from those when observed during the daytime with the naked eye.

Before beginning the operation:

- Install the storage battery;
- Switch on the sight by turning knob 4 (Fig. 18) clockwise;
- Look through the sight and turn knob 4, ЯРКОСТЬ СЕТКИ (RETICLE BRIGHTNESS) to set the reticle image sharpness.

When using on assault rifles, machine guns or sniper rifles, aim at the target by bringing the vertex of the aiming angle of the reticle over the target. For distances up to 400 meters, set the ballistic cam 12 to division mark 4 and aim at the lower edge of the target or, if the target is high (running figures, etc.) at the middle part of it. For distances greater than 400 m, set the ballistic cam to the mark corresponding to the distance rounded up to the nearest hundred meters and aim at the middle part of the target.

In case the view through the scope deteriorates, replace the discharged storage battery in the scope with the one in the accessories kit.

It is necessary to differentiate between firing at a stationary target, firing at a moving target, rapid fire and firing when an infrared searchlight is present. During rapid fire you must take into account that visibility will worsen after each shot and that it takes some time to recover. To avoid losing the target after the shot, keep the weapon and scope in the same orientation and observe closely the area where the target had appeared after visibility is recovered.

For firing at moving targets moving toward or away from the shooter at up to 400 m, the ballistic cam should be set at 4. For distances greater than 400 m estimate the distance at which the target will appear and be fired at and set the ballistic cam for the corresponding distance.

For firing at targets moving at an angle to the shooter the target can either be tracked and led or waited for. To lead a target moving at 90° to the shooter with a speed equal to 3 m/s at a range of 300 m lead the target by 0.04 and for distances greater than 300 m by 0.06.

Using the scope at moving targets when the waiting method is used, the time to fire is not determined by the relative position between the target and the terrain as in daylight shooting but by the targets position relative to the vertical lines of the reticle in the scope's field of view. For firing at targets moving rapidly, the lead is increased proportionately to the increased speed. To keep from losing the target from the field of view of the scope after a shot or burst, it is necessary to keep moving the weapon in the directions the target was moving. When visibility returns, re-determine the lead and continue to fire.

When using the waiting method, after a shot or burst, move the weapon in the direction the target was moving and when a distance equal to the original lead is achieved fire another shot or burst.

The infrared illuminator in a night sight can be seen as a light green patch whose brightness depends on the remoteness and power of the searchlight. Besides the spot, the beam from the searchlight can be seen through the scope as a light band on the terrain.

If the searchlight is directed at an angle greater than 60° from the observation plane the spot will not be seen in the scope. The approximate location of the searchlight can be determined by observing where the beam is brightest on the terrain. If the spot from the searchlight is very bright, install the diaphragm on the scope.

The distance to the searchlight can be estimated by observing how the beam strikes local objects in the terrain. Determination of the range to a target is aided by close observation of the terrain during daylight.

If the distance to a target is outside the range of visibility, it is possible to illuminate it with a 30 mm or 40 mm flare cartridge, then determine the range to the target and hit it.

If while operating the scope bright light sources (e. g. parachute flares, vehicle headlights, etc.) appear in the field of view move the scope to the side pointed away from the light source to avoid damage to the image converter. If the light source remains illuminated for an extended period of time, switch the scope off.

When finished firing or observing using the scope, the scope is switched off by turning the brightness control knob 16 (Fig. 3) to the ВЫКЛ (off) position.

When using on grenade launchers, aiming is affected by shifting the weapon in azimuth and elevation in relation to the target. When firing the grenade launcher with the night sight, set knob 8 with scale 9 (Fig. 18) to "+" if the ambient temperature is above 0°C or "—" if the temperature is below 0°C. When aiming, align the aiming point with the appropriate reticle aiming line based on the estimated range and any necessary lead for a moving target.

In the case of decreased visibility due to a decrease in image brightness, replace the discharged storage battery with a spare one available in the individual STA kit.

13.2. Target Ranging Using the Sight

Target ranging is carried out:

— by using landmarks and terrain features at predetermined ranges;
— by angle value of the target and terrain features.

For target ranging by the angle value of terrain features (targets) it is necessary to know the feature (target) height.

Knowing the height, proceed as follows:

— Determine the angle value of the target in mils using the angle and reticle lines in the field of vision. The angle dimensions are given in Fig. 4.
— Calculate the range by the formula:

$$Д = \frac{В}{У}$$

Where Д — range, m;
В — feature (target) height, m;
У — angle value of target, mil.

For practical target ranging by means of the aiming signs and reticle lines use the examples in Fig. 16 as a guide.

13.3. Preparing for Travel

When preparing for travel, do the following:

— Switch off the sight;
— Install the diaphragm;

— Remove the storage battery from the sight and put in a pocket on the bag.
— Remove the sight from the weapon mount and put in the bag;
— Put the filter in one of the bag pockets.

14. MAINTENANCE

14.1. General Directions

To maintain the combat readiness of the sight, to insure its faultless operation, to increase the length of the scheduled maintenance periods, and to discover and eliminate causes in a timely manner that may cause premature wear and damage of units and parts, perform the technical inspections and maintenance operations at the scheduled times.

The maintenance work is classified as follows:

— Routine maintenance;
— Maintenance l (TO1);
— Maintenance 2 (TO2).

Sights in storage require routine maintenance and Maintenance 2.

14.2. Routine Maintenance

Routine maintenance of the sight is carried out by the shooter the sight is assigned to, under the supervision of the platoon commander.

Routine maintenance is carried out in the time specified by the schedule during off days, prior to installing the sight on the weapon, before each use for firing, and after marching with the sight installed on the weapon; at least once per month.

Measure voltage of the storage battery weekly.

Routine maintenance of sights stored in warehouses is carried out by the warehouse manager as part of his daily work*.

Routine maintenance includes the technical inspections as stated in section 11. In addition perform the following:

* Does not charge the storage batteries or measure their voltage. Checks the sights for operability using one storage battery.

— Clear the sight of dust, mud, and moisture;
— Clean external surfaces of metal parts and sparingly apply grease ГОИ-54п ГОСТ 3276-74 to the unpainted surfaces;
— Clean the sights contacts for the storage battery with ammonia solution ГОСТ 9-77.
— Clean external optical parts;
— Replace the used desiccators in the sight with the spare one;
— Replace faulty units and parts of the sight with spares taken from the individual STA kit, per procedures in section 17;
— Send the batteries for charging;
— Tighten the screw caps of the storage batteries and clean any mud or salts off them;
— Adjust the sight fit on the weapon mount;
— Wipe down the packing case and repair and repaint it as needed.

14.3. Maintenance 1 (T01)

Maintenance 1 (TOI) is carried out by the shooter under supervision of the platoon commander; enlisting specialists form the workshop, if necessary.

Maintenance TO1 is carried out in the following situations:

— When the sight is supplied to the unit;
— After practice firing;
— After firing.
— At least once in 2-3 months (except as noted above).

For Maintenance TO1, perform all of the procedures of the Routine Maintenance and in addition:

— Switch on the sight for two-hours of operation (with the diaphragm aperture closed) to maintain its electrical performance;
— Check the range of visibility on terrain using a real target (off a man’s height, etc.) if the sight has been out of use for a year or more;
— Check the level and density of the electrolyte in the storage batteries and add or replace, if necessary.

If any problems that have been discovered cannot be remedied by use of the individual STA kit, send the sight to the repair shop.

14.4. Maintenance 2 (TO2)

Maintenance TO2 is performed once every two to three years for sights in service and once every 5 years for sights in storage*.

These maintenance procedures are performed in specialized workshops using a group STA kit, and specialized equipment and tools, compliant to the instructions for the use of the group STA kit for the sight.

For Maintenance TO2, complete the requirements for TO1 and in addition:

— Check the resolution and image quality;
— Check the range of adjustment and line of sight for azimuth and elevation;
— Check the positioning of the eyepiece relative to the EOP screen;
— Check the STA kit in accordance with the list of standard equipment.

If necessary:

— Replace defective parts and units with spare ones taken from the group STA kit (per the instructions for the group STA kit);
— Adjust the sight using the controlled adjusting instruments in the workshop;
— Re-rustproof and replace packing grease where necessary.

Opening the sight for replacement of the grease only is prohibited!

In preparation for the sight for long-term storage, except for the above works, you must do the following:

— Apply grease ГОИ-54п ГОСТ 3276-74 to the unpainted surfaces of the sights and STA;
— Wrap the rust proofed parts in oil paper ГОСТ 1341-74;
— Discharge the storage batteries 2НКБН-1.5, pour out the electrolyte, tighten the screw caps, and wash the batteries on the outside with distilled water;
— Apply grease ГОИ-54п ГОСТ 3276-74 to the contacts and screw caps of the batteries.

* Switch on the sights for two hours of continuous operation, yearly.

15.STORAGE RULES

15.1. Storage

Sights that are thoroughly inspected, cleaned and repaired may be put in storage (see Maintenance TO2). The sights are stored in packing cases complete with individual STA kits* in heated storerooms at a temperature between 5 — 35°C and relative humidity not greater than 70% on racks, shelves, or in cabinets. Daily temperature fluctuations in the storerooms should not exceed 5°.

It is forbidden to store sights on the floor, near ovens/furnaces, near windows, and in the sun.

For sights stored for extended periods, perform Maintenance TO2. With troops in barracks, the sights are stored on specially equipped racks or in specially equipped cabinets. When in the field in camps, the sights are stored in specially assigned rooms.

15.2. Upkeep

It is necessary to keep the sight clean and protected against dust and moisture while in service and against shocks while in storage and during transportation.

Keep the optical elements clean. For cleaning external optical surfaces use flannel wipes ГОСТ 7259-77 or cotton wool ГОСТ 10477-75, alcohol ГОСТ 18300-72 or ether ГОСТ В6265-74 or a mixture (10% alcohol and 90% ether).

Oily spots are removed from glass surfaces using clean flannel wipes or a piece of cotton wool.

In case of heavy contamination, cleaning is carried out in the following

— Wind a piece of cotton wool on a wooden stick;
— Wipe the glass with the cotton wool mounted on the stick dampened with solvent avoiding touching the mount.

When cleaning, insure that no solvents (alcohol, ether) get under the mount as the packing grease may dissolve and the packing will become deteriorated.

* Dry batteries are stored together with the sight as is stated in the respective section of the Instruction for Storage batteries 2НКБН-1.5 and 3НКБН-1.5.

External unpainted parts of the sight and STA kit should be rust proofed with grease ГОИ-54п ГОСТ 3276-74.

15.3. Shipping

The sight together with the individual STA kit may be shipped in the packing case by any transport means for any distance.

Prior to shipping, insure the sight and STA kit are securely fastened in the packing case with safety locks.

For shipping, the packing case should be stowed with the cover facing up and securely fastened. Do not turn the case on its side or top and do not throw.

When shipping via vehicles, put dry bedding on the floor of the vehicle bed. Place the packing cases in the front part of the bed, close to each other. Interlay the cases then secure with tie downs and cover with a tarp.

Should the necessity arise, the sight mounted on the weapon may be transported by armored carriers or vehicles. When riding in tanks or APC's, hold the weapon with the sight mounted in hands to protect from shocks and banging against the armor.

16. POSSIBLE FAULTS, THEIR CAUSES AND METHODS USED FOR THEIR ELIMINATION

16.1. General Directions

Should problems arise in operation of the sight or its elements for the first time, check that the sight has been correctly prepared for combat action. That is check:

— fastening of the sight on the weapon mount;
— whether the diaphragm is open;
— to insure no dust, mud, oil, rime, or water is on the objective and/or eyepiece;
— charge of the storage battery;
— knob 4 (Fig. 18) is in the ON position.

Particular attention should be paid to cleanness of the battery terminals and contacts of the reticle lamp.

16.2. Troubleshooting Chart

The list of possible problems is given in table 3.

Table 3

Defect (external indication)	Cause	Remedy
No reticle is seen in the sight field of vision out.	Reticle lamp burnt out. Lamp contacts oxidized.	Replace the lamp with a spare one. Clean the contacts of the lamp and in the battery holder.
Clicks of the operating sight are weak.	Storage battery 2НКБН-1.5 is discharged.	Replace the battery with a charged one.
Image brightness falls sharply after reaching maximum or brightness oscillates and causes difficulty in operating the sight.	Light overload. Puncture of voltage converter transformer.	Put diaphragm on the objective. Send the sight to the repair shop.
Terrain image is weak and dim.	Outer surfaces of the eyepiece and/or objective are dirty or have sweated.	Clean the eyepiece and/or objective with a wipe.
Terrain image is weak and dim and flashes and twinkling are seen in the field of vision.	Inner surfaces of the eyepiece, objective or photocathode have sweated.	Send the sight to the repair shop.
Flashes and twinkling are seen in the field of vision.	Moisture has entered the sight.	Blow the sight out with dry air from a bottle at minimum pressure of 100 atm*. Replace desiccant.

* The sight is connected to the bottle using a special regulator that provides air supply at pressure maximum of 0.2 atm. Purge the sight in the repair shop.

No glow of the EOP screen and clicks of the operating converter are heard.	The EOP is defective.	Send the sight to the repair shop.
No clicks of the operating voltage converter are heard	The converter is defective.	Send the sight to the repair shop.
Dark spots precluding viewing appear in the field of vision.	Particles have entered in the field of vision or the EOP is damaged by point light sources.	Send the sight to the repair shop.
When the sight is turned on, the screen begins glowing though the image quality is bad and off to the side from the center of the screen or disappears completely.	Image converter is damaged by a bright light source.	Switch on the sight for 5 — 10 min. at a time at regular intervals for two days. If after this, the sight fails to operate properly, send the sight to the repair shop.

17. INDIVIDUAL STA KIT APPLICATION

17.1. General Directions

Defective units and parts of the sight must be replaced by spare ones taken from the Individual STA Kit. It is allowed to replace the units and parts that are indicated in this section. Only the bag may be repaired and the packing case repainted. All problems may be corrected in the repair shop.

For replacement, determine the exact problem and determine its nature. Before beginning replacement, prepare the workspace and tools.

17.2. Storage Battery Replacement

For replacement:

— Turn off the sight;
— Release catch 2 (Fig. 18), open cover 3;
— Remove the storage battery;
— Clean grease from contacts of the spare battery and install it into the sight so that its contacts fit against the contacts in the sight body.
— Close cover 3;

— Close catch 2.

17.3. Reticle Lamp Replacement

For replacement:

— Switch off the sight;
— Remove the defective lamp and insert the spare one taken from the STA kit using wrench 5 (Fig. 1);
— Switch on the sight and check the brightness of the reticle illumination.

17.4. Desiccator Replacement

Replace desiccator 15 (Fig. 7) in a dry room. Keep the desiccator 4 open no more than 1 — 2 minutes.

To insure proper replacement, proceed as follows:

— Prepare the spare desiccator from the STA kit by unscrewing it from its holding beaker;
— Use wrench tool 5 (Fig. 1) to unscrew the saturated desiccator from the sight body, and immediately screw the spare one.

Screw the desiccator in until the rubber gasket is slightly deformed.

The silica gel indicator ГОСТ 8984-75 that is saturated with moisture may be regenerated by baking at a temperature of 120±3°C. To do this, unscrew the desiccator cover and pour the silica gel indicator into a clean metal vessel that is placed on a heat source (electric oven, Sterno, coals, etc.).

Measure the temperature by means of a thermometer on the vessel bottom.

Avoid contacting the silica gel indicator with a flame.

17.5. Eye-shield Replacement

The eye-shield with blinds is intended for use under the following conditions:

— During operation at night under conditions requiring high camouflage security, the self-closing blinds of the eye-shield prevent light spots from appearing on the shooter’s face when looking aside from the exit pupil;

— When adjusting the sight in the daytime during sunny weather if the target is not visible because of illumination of the sight photoresistor from the eyepiece side.

For replacement of eye-shield 54 (Fig. 7):

— Remove clamp 51;
— Take off eye-shield 54 (Fig. 7) without blinds;
— Put the spare eye-shield with shutters on the eyepiece mount extending it slightly. Install the eye-shield so that the closing line of the blinds lies horizontally when the sight is in the operating position;
— Secure the eye-shield with clamp 51.

17.6. Ballistic Cam Replacement

17.6.1 To replace the ballistic cam, scale 9 (Fig. 18) for the AKM with one for the RPK, PK, SVD, AK74, RPK74, or RPG-7 do the following:

— Set the ballistic cam for the AKM to division «3»;
— Unscrew screws 10 (Fig. 18) using wrench 5 (Fig. 1) without rotating adjustment knob 8;
— Remove adjustment knob 8;
— Remove ballistic cam, scale 9;
— Install different ballistic cam using the setting describe as follows for the cam being installed:
— «4» for ballistic cams for RPK or PK;
— «5» for ballistic cams for SVD, AK74 or RPK74;
— «+» for ballistic cam for RPG-7;
— Install adjustment knob 8 and screw in Screws 10 without turning knob 8;
— After installing the ballistic cam for a PK, loosen the Screws 10 by 1 — 2 turns and turn the adjustment knob 8 by 6 divisions in the direction of the pointer labeled BBEPX or UP with the ballistic cam held in place so it doesn’t turn;
— Tighten Screws 10 without turning the mechanism.
— Zero the scope and the weapon for the new ballistic cam per subsection 12.3 of this manual.

17.6.2 To replace the ballistic cam, scale 9 (Fig. 18) for the RPK with one for the AKM, PK, SVD, AK74, RPK74, or RPG—7 do the following:

— Set the ballistic cam for the RPK to division «4»;
— Unscrew screws 10 (Fig. 18) using wrench 5 (Fig. 1.) without rotating adjustment knob 8;

— Remove adjustment knob 8;
— Remove ballistic cam, scale 9;
— Install different ballistic cam using the setting describe as follows for the cam being installed:
— «3» for ballistic cam for AKM;
— «4» for ballistic cam for PK;
— «5» for ballistic cams for SVD or AK74;
— «6» for ballistic cam for RPK74;
— «+» for ballistic cam for RPG—7;
— Install adjustment knob 8 and screw in screws 10 without turning knob 8;
— After installing the ballistic cam for a PK, loosen the Screws 10 by 1 - 2 turns and turn the adjustment knob 8 by 5 divisions in the direction of the pointer labeled BBEPX or UP with the ballistic cam held in place so it doesn't turn;
— Tighten screws 10 without turning the mechanism.
— Zero the scope and the weapon for the new ballistic cam per subsection 12.3 of this manual.

17.6.3 To replace the ballistic cam, scale 9 (Fig. 18) for the PK with one for the AKM, RPK, SVD, AK74, RPK74, or RPG-7 do the following:

— Unscrew screws 10 (Fig. 18) using wrench 5 (Fig. 1) without rotating adjustment knob 8;
— Remove adjustment knob 8;
— Remove ballistic cam, scale 9;
— Install different ballistic cam using the setting describe as follows for the cam being installed:
— «3» - for ballistic cams for AKM or RPK;
— «4» for ballistic cam for SVD;
— «5» for ballistic cams for AK74 or RPK74;
— «+» for ballistic cam for RPG-7;
— Install adjustment knob 8 and screw in Screws 10 without turning knob 8;
— Zero the scope and the weapon for the new ballistic cam per subsection 12.3 of this manual.

17.6.4 To replace the ballistic cam, scale 9 (Fig. 18) for the SVD with one for the AKM, RPK, PK, AK74, RPK74, or RPG-7 do the following:

— Set the ballistic cam for the SVD to division «5»;
— Unscrew screws 10 (Fig. 18) using wrench 5 (Fig. 1) without rotating adjustment knob 8;
— Remove adjustment knob 8;

— Remove ballistic cam, scale 9;
— Install different ballistic cam using the setting describe as follows for the cam being installed:
— «3» for ballistic cam for AKM;
— «4» for ballistic cams for RPK or PK;
— «5» for ballistic cams for AK74; K
— «6» for ballistic cam for RPK74;
— «+» for ballistic cam for RPG-7;
— Install adjustment knob 8 and screw in Screws 10 without turning knob 8;
— After installing the ballistic cam for a PK, loosen the Screws 10 by 1 - 2 turns and turn the adjustment knob 8 by 4 divisions in the direction of the pointer labeled BBEPX or UP with the ballistic cam held in place so it doesn't turn;
— Tighten screws 10 without turning the mechanism;
— Zero the scope and the weapon for the new ballistic cam per subsection 12.3 of this manual.

17.6.5 To replace the ballistic cam, scale 9 (Fig. 18) for the AK74 with one for the AKM, RPK, PK, SVD, RPK74, or RPG-7 do the following:

— Set the ballistic cam for the AK74 to division «5»;
— Unscrew screws 10 (Fig. 18) using wrench 5 (Fig. 1) without rotating adjustment knob 8;
— Remove adjustment knob 8;
— Remove ballistic cam, scale 9;
— Install different ballistic cam using the setting describe as follows for the cam being installed:
— «3» for ballistic cam for AKM;
— «4» for ballistic cams for RPK or PK;
— «5» for ballistic cams for SVD or RPK74;
— «+» for ballistic cam for RPG-7;
— Install adjustment knob 8 and screw in Screws 10 without turning knob 8;
— After installing the ballistic cam for a PK, loosen the Screws 10 by 1 - 2 turns and turn the adjustment knob 8 by 5 divisions in the direction of the pointer labeled BBEPX or UP with the ballistic cam held in place so it doesn't turn;
— Tighten screws 10 without turning the mechanism;
— Zero the scope and the weapon for the new ballistic cam per subsection 12.3 of this manual.

17.6.6 To replace the ballistic cam, scale 9 (Fig. 18) for the RPK74 with one for the AKM, PK, SVD, AK74, or RPG—7 do the following:

— Set the ballistic cam for the RPK74 to division «5»;
— Unscrew screws 10 (Fig. 18) using wrench 5 (Fig. 1) without rotating adjustment knob 8; j
— Remove adjustment knob 8;
— Remove ballistic cam, scale 9;
— Install different ballistic cam using the setting describe as follows for the cam being installed:
— «3» for ballistic cams for AKM or RPK;
— «4» for ballistic cams for SVD, AK74 or PK;
— «+» for ballistic cam for RPG-7;
— Install adjustment knob 8 and screw in Screws 10 without turning knob 8;
— After installing the ballistic cam for a PK, loosen the Screws 10 by 1 - 2 turns and turn the adjustment knob 8 by 6 divisions in the direction of the pointer labeled BBEPX OR UP with the ballistic cam held in place so it doesn’t turn;
— Tighten screws 10 without turning the mechanism.
— Zero the scope and the weapon for the new ballistic cam per subsection 12.3 of this manual.

17.6.7 To replace the ballistic cam, scale 9 (Fig. 18) for the RPG—7 with one for the AKM, PK, SVD, AK74, or RPK74 do the following:

— Unscrew screws 10 (Fig. 18) using wrench 5 (Fig. 1) without rotating adjustment knob 8;
— Remove adjustment knob 8;
— Remove ballistic cam, scale 9;
— Install different ballistic cam using the setting describe as follows for the cam being installed:
— «3» for ballistic cams for AKM or RPK;
— «4» for ballistic cams for SVD, AK74, RPK74 or PK;
— Install adjustment knob 8 and screw in Screws 10 without turning knob 8;
— After installing the ballistic cam for a PK, loosen the Screws 10 by l - 2 turns and turn the adjustment knob 8 by 6 divisions in the direction of the pointer labeled BBEPX OR UP with the ballistic cam held in place so it doesn’t turn;
— Tighten screws 10 without turning the mechanism;
— Zero the scope and the weapon for the new ballistic cam per subsection 12.3 of this manual.

Appendix 1

Norms for Consumption of Materials per Maintenance Activity

Mass, g

Material	Consumption	
	Routine Maintenance	Maintenance T01
Grease ГОИ-54п ГОСТ 3276-74	5	5
Flannel ГОСТ 7259-77	200x200 mm (for 10 TO)	200x200 mm
Cotton wool ГОСТ 10477-75	10	20
Denatured Ethanol ГОСТ 18300-72	10	15
Ethyl ether ГОСТ В6265-74	20	30
Ammonia spirit for medical purposes ГОСТ 9-77	15	20

Note. Norms for consumption of materials for Maintenance TO2 are given in the instructions for use of the Group STA Kit.

FIGURES

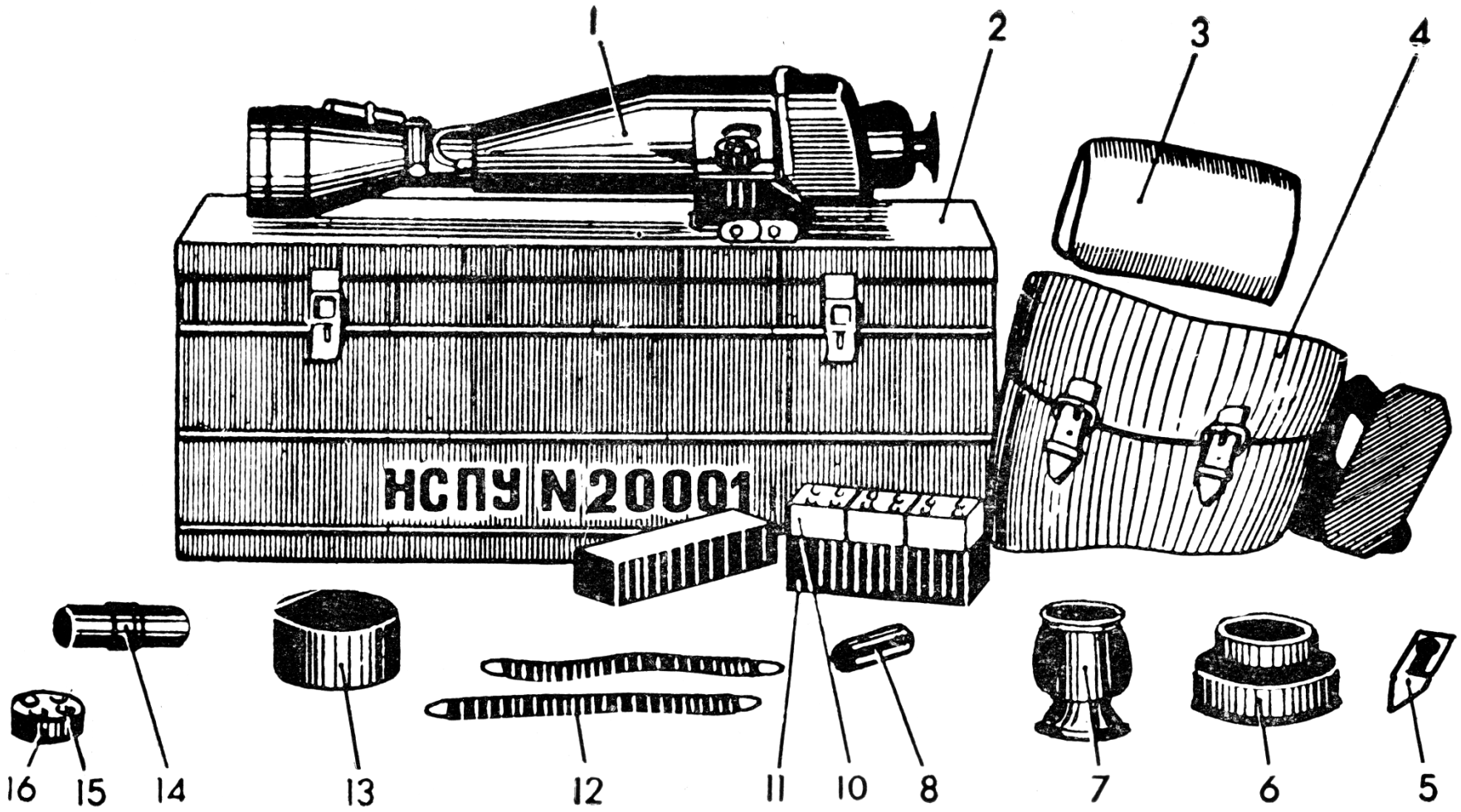


Fig. 1. **Standard equipment for sight:**

1 — article НСПУ (NSPU) АЛ3.812.033; 2 — packaging case АЛ4.161.237; 3 - wipe АЛ4.165.005; -4 —bag АЛ4.165.005; 5 — wrench АЛ8.896.002; 6 — diaphragm АЛ6.274.029; 7 — eye-shield АЛ6.548.035; 8 — dessicant in beaker АЛ5.883.030; 10 — storage battery АЛ5.529.003; 11 — accumulator case АЛ6.875.041; 12 — strap АЛ6.834.042; 13 — filter АЛ5.940.139; 15 — lamp АЛ6.615.070; 16 — lamp magazine АЛ8.212.000

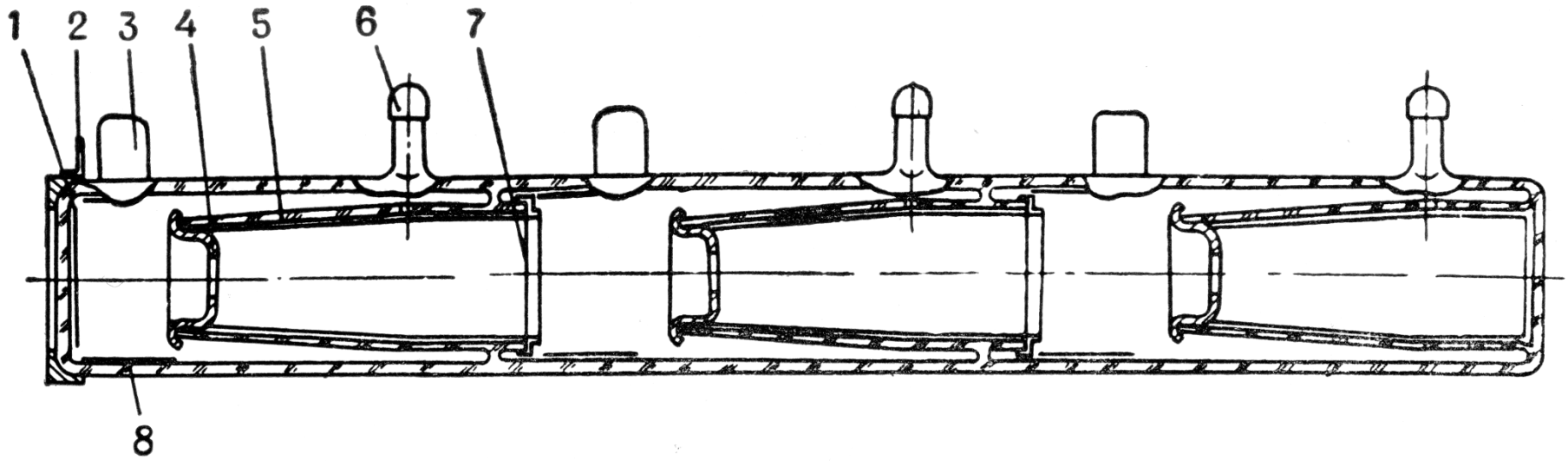


Fig.2 Image converter components

1 — photocathode; 2 — contact; 3 —lead-in for sub-focusing voltage; 4 — diaphragm; 5 — glass cone; 6 — h-v lead-in; 7 — screen; 8 — focusing electrode

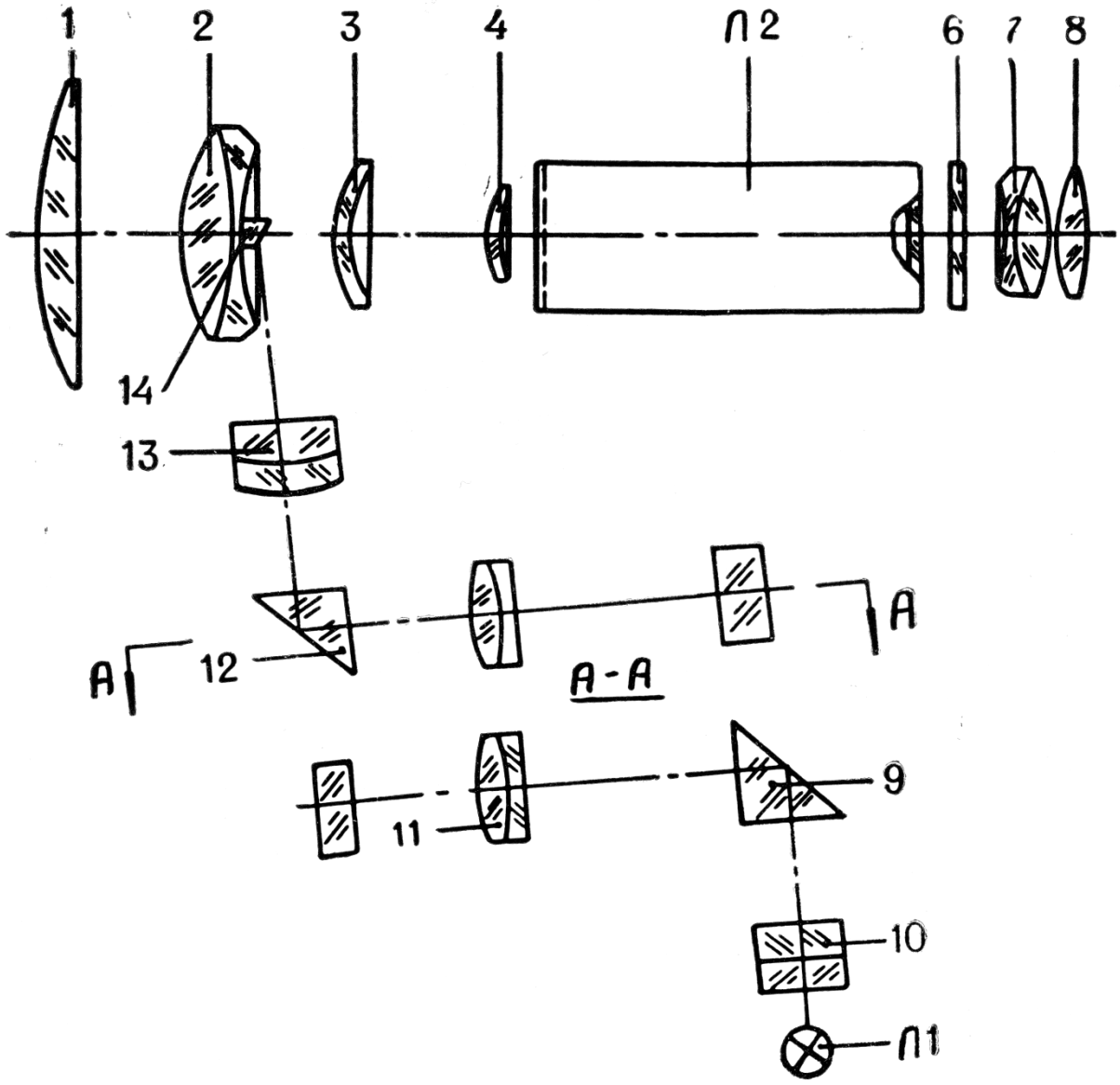


Fig. 3. **Electro- Optical diagram**

1 — lens АЛ7.538.024; 2 — lens АЛ5.932.080; 3 — lens АЛ7.566.067; 4 — lens АЛ7.533.052; 6 — protective glasses АЛ8.640.163; 7 — lens АЛ5.932.081; 8 — lens АЛ7.504.247; 9 — prism АР-90º АЛ7.200.082; 10 — reticle АЛ5.937.172; 11 — lens АЛ5.930.405; 12 — prism АР-90º АЛ7.200.082; 13 — lens АЛ5.930.406; 14 — prism АЛ7.205.010

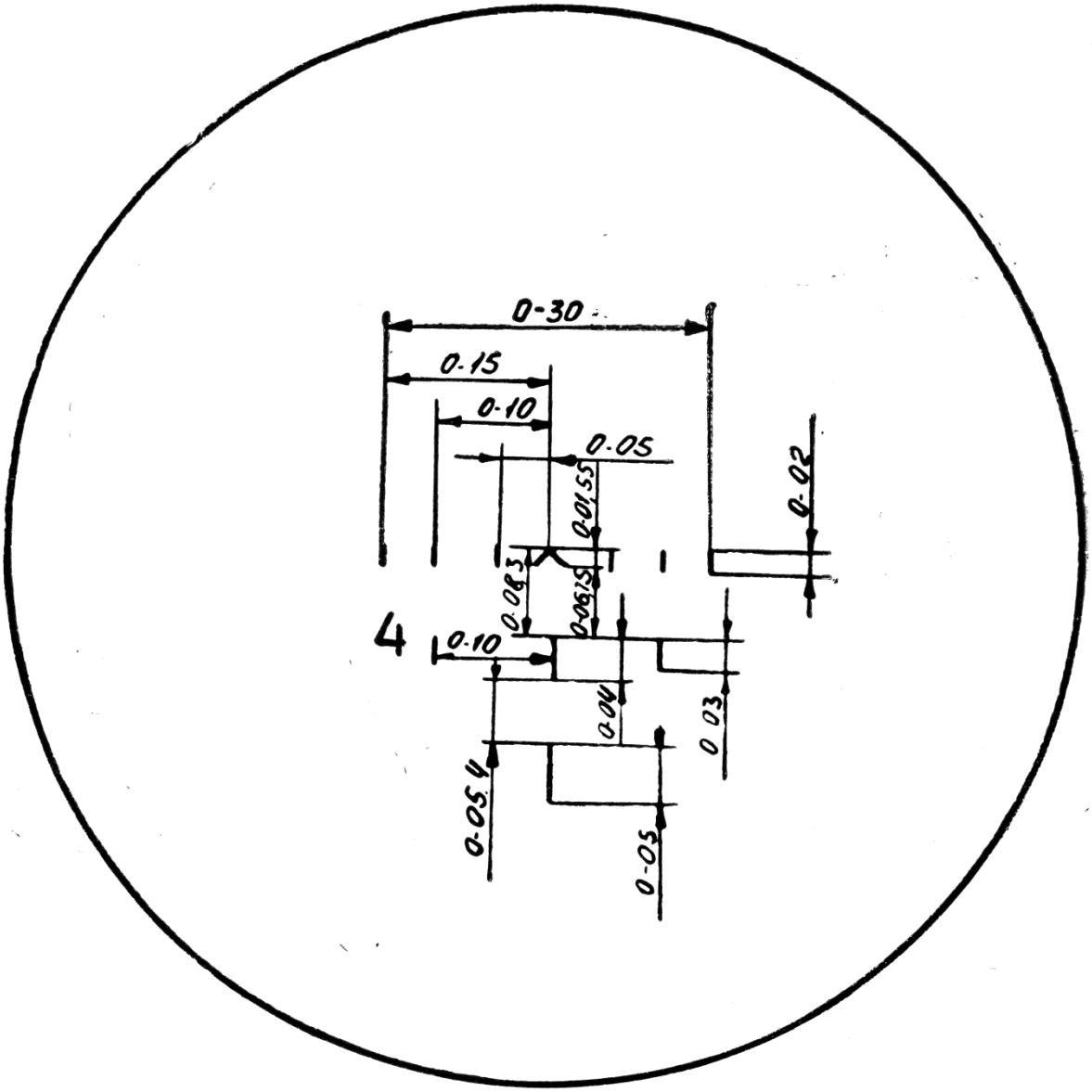
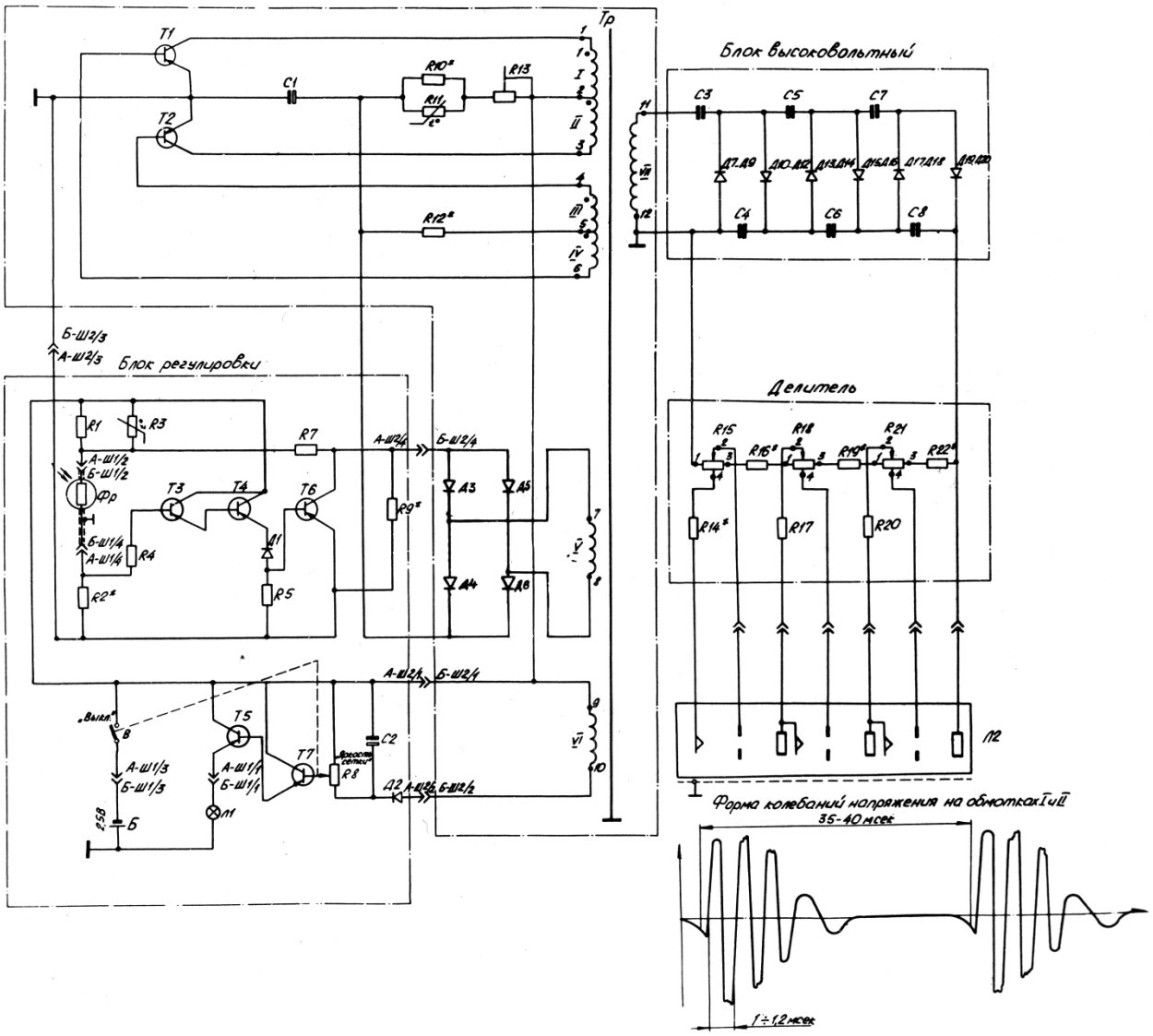


Fig. 4. **Sight field of vision**

(angle dimension in mils)


Блок высоковольтный
Делитель
Блок регулировки
Форма колебаний напряжения на обмотках I и II
35-40 мсек
1÷1,2 мсек

L I S T
elements of the electrical circuit (see Fig. 5)

Code	Title	Num.	Note	Code	Title	Num.	Note
	Resistor			Фр	Photoresistor ФПФ-7-1	1	
R1	ОМЛТ-0,25-20 kОм ±5%	1		С1	Capacitor К53-4-6-100±30%	1	
R2*	ОМЛТ-0,25-100 kОм ±5%	1	47, 100, 80, 270 kОм	С2	Capacitor К53-4-15-6,8±30%	1	
R3	Thermistor ММТ-1-100 kOm	1		С3…С8	Capacitor К74-7-150	6	
R4	ОМЛТ-0,25-16 kОм ±5%	1		Б	Batteries 2НКБН-1.5 пф	1	
R5	ОМЛТ-0,25-180 kОм ±10%	1		В	Microswitch МП7	1	
R7	ОМЛТ-0,25-56 kОм ±5%	1		Д1...Д6	Diode 2Д 102 А	6	
R8	СП4 1а-100 kОм-А-12	1		Д7...Д20	Selenium rectifier 3ГЕ 220 АФ	14	in series
R9*	ОМЛТ-0,25-360 Ом ±5%	1	240, 300, 360, 430 Ом, 1 kОм	Л1	Lamp СМ2,5-0,075	1	
R10*	ОМЛТ-0,25-180 kОм ±10%	1	330, 390 Ом	Л2	ЕОР	1	
R11	Thermistor ММТ-1-1 kОм	1		Т1, Т2	Transistor П217	2	
R12*	МОН-0,5-1,5 Ом±10%	1	1; 1,5 Ом	Т3…Т5, Т7	Transistor 1Т308А	4	
R13	СП5-3; 680±10%	1		Т6	Transistor 1Т403Б	1	
R14*	С3-5а-5кв-12 ГОм±10%	1	12, 15 ГОм	Тр	Transformer	1	
R15	СП4-4-220 МОм	1		А-Ш1, А-Ш2	Fork РШ2Н-1-5	2	
R16*	С3-5б-15кв-10 ГОм±10%	1	10, 12, 15 ГОм	Б-Ш1, Б-Ш2	Socket РГ1Н-1-1	2	
R17	КИМ-0,125-200 МОм±20%	1					
R18	СП4-4-220 МОм	1					
R19*	С3-5б-15кв-10 ГОм±10%	1	10, 12, 15 ГОм				
R20	КИМ-0,125-22 МОм	1					
R21	СП4-4-220 МОм	1					
R22*	С3-5б-15кв-10 ГОм±10%	1	10, 12, 15 ГОм	* Selected in the regulation			

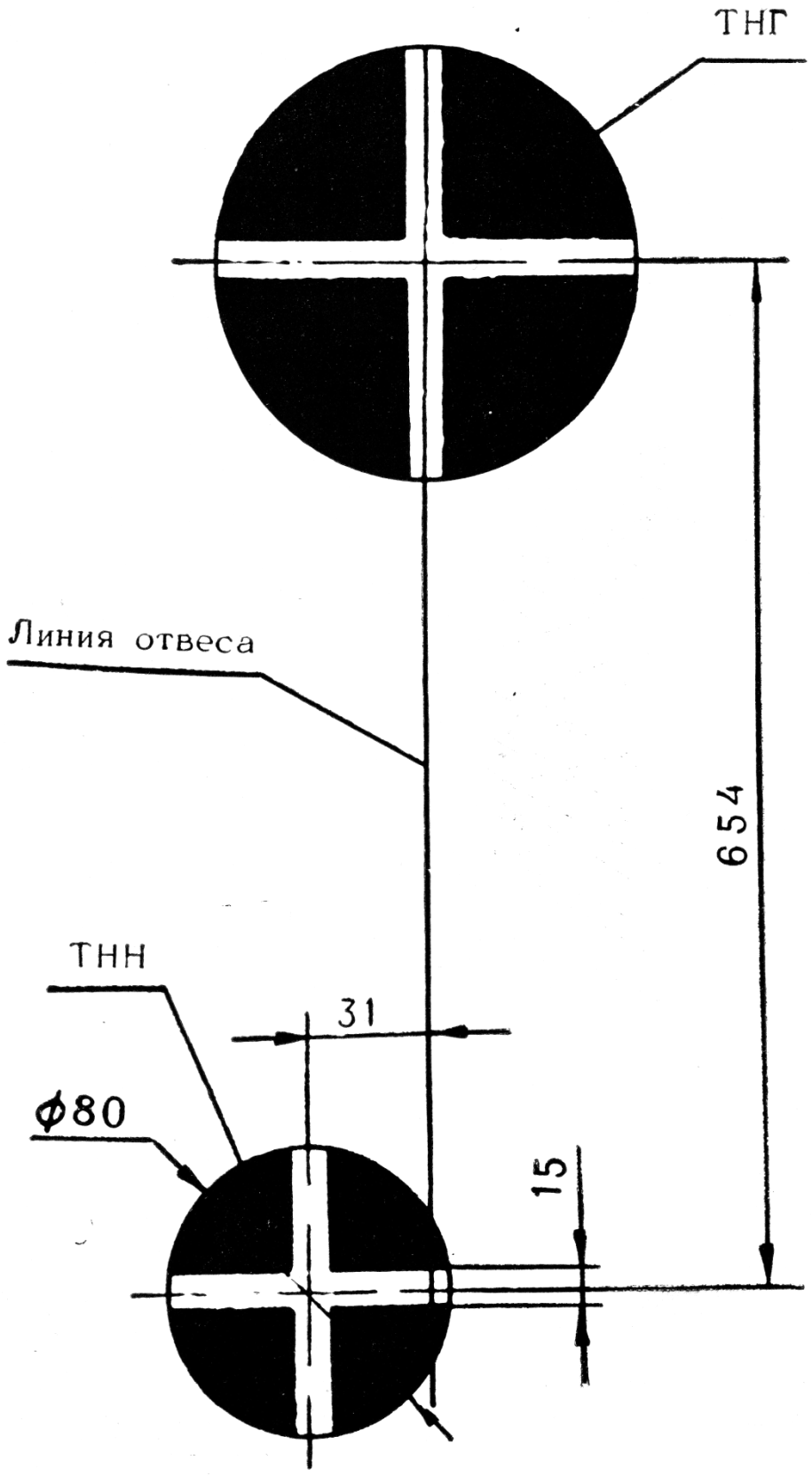


Fig. 6. **Diagram for sight adjustment template for NSPU Sight**

ТНГ – launcher bore aiming point; ТНН – sight aiming point

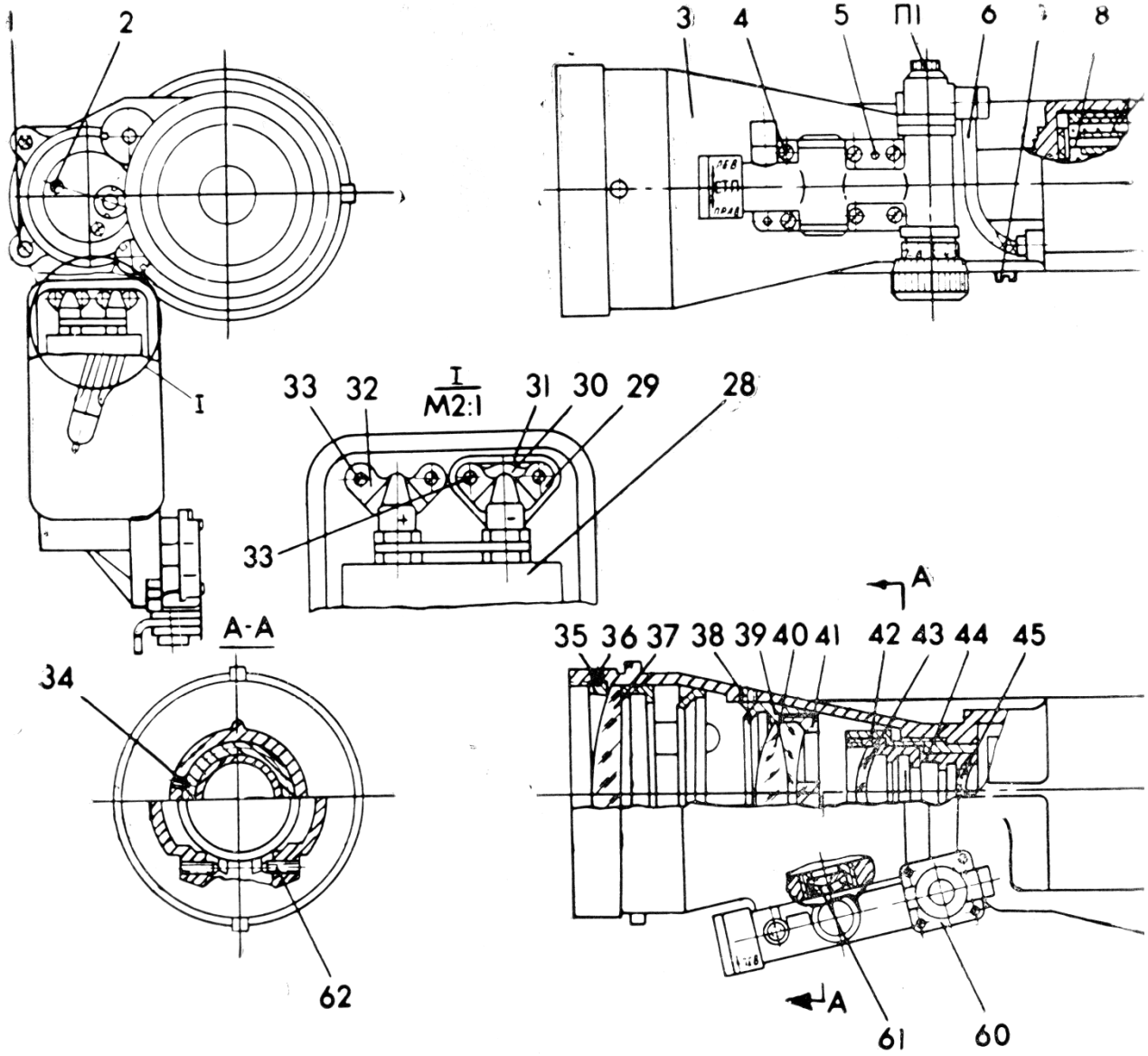
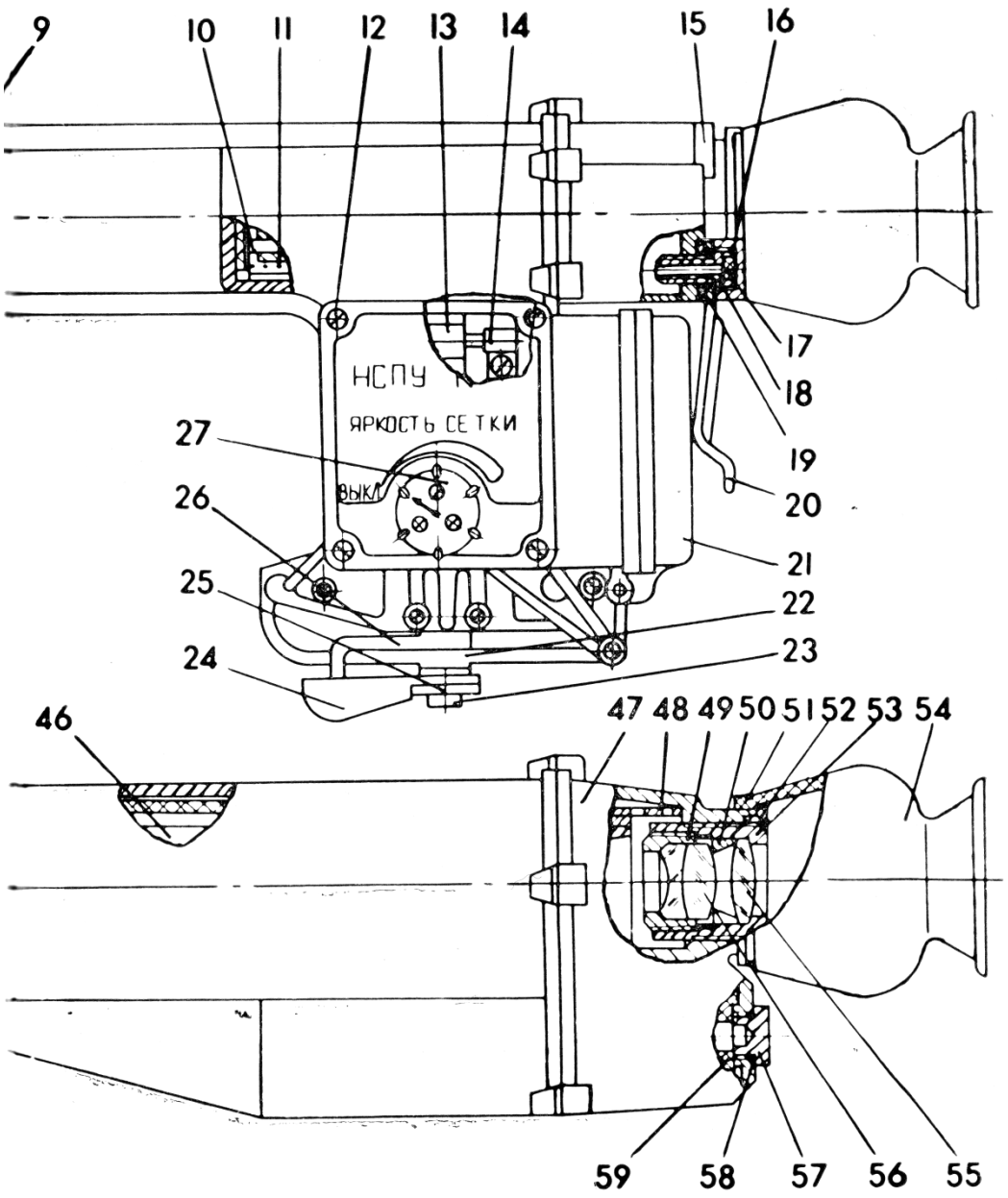
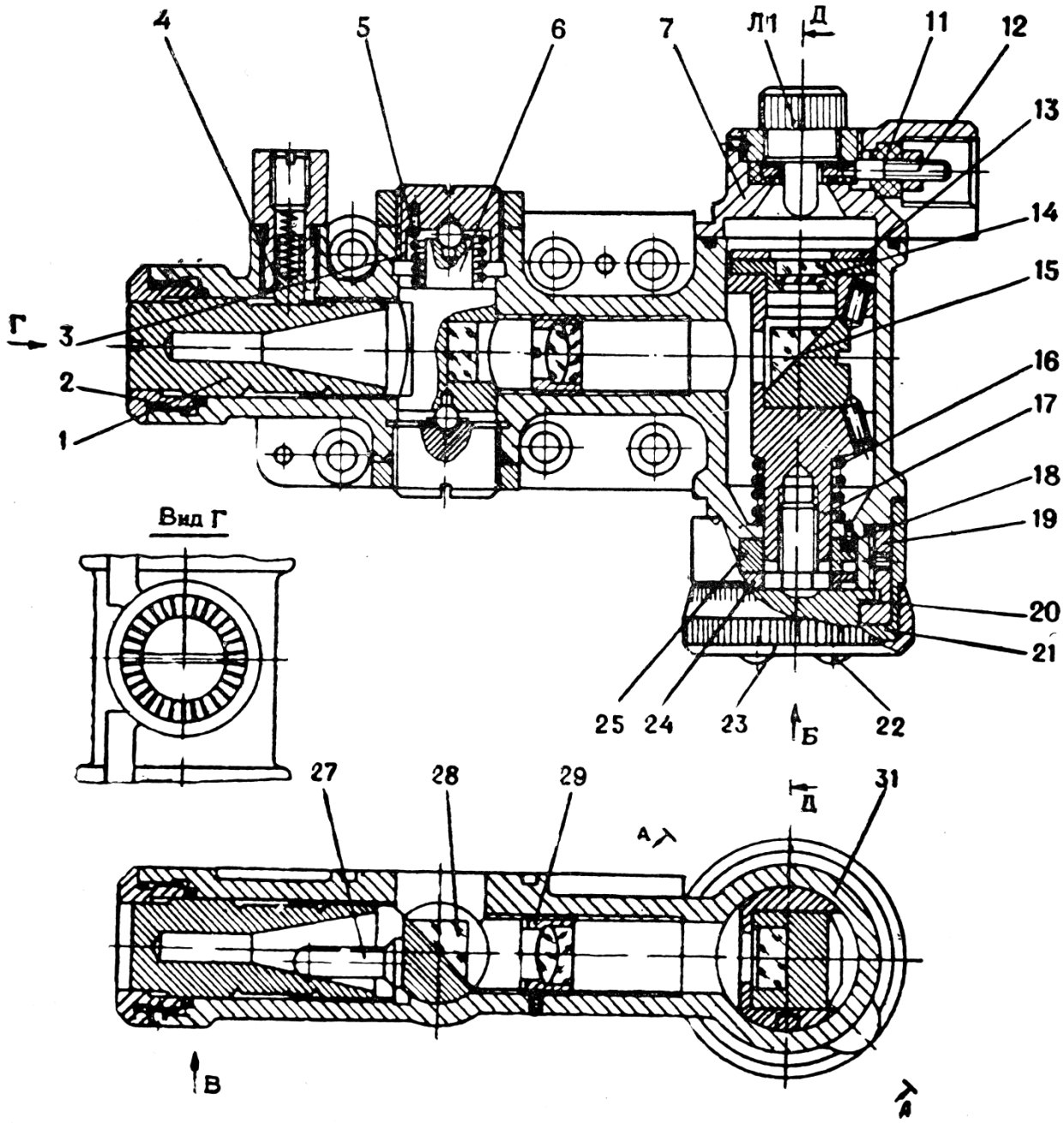


Fig. 7. **General View of Article NSPU АЛ3.812.033:**

l — screw А.М4-6g×21.58.016 ГОСТ 1491-80; 2 — screw А1.М4-6g×8.58.016 ГОСТ 1745-80; 3 — body АЛ8.020.405; 4 — screw А.М2,5-6g×5.58.016 ГОСТ 1491-80; 5 — pin $2С_3$×6.016 ГОСТ 3128—70; 6 — wire АЛ6.640.190; 7 — plug АЛ8.656.083; 8, 10 — contact АЛ6.622.042; 9, 11 — spring АЛ8.383.087; 12 — screw А1.М3-6g×8.58.016 ГОСТ 17475—80; 13 — voltage converter АЛ5.087.031; 14 — cable АЛ6.644.108; 15 — desiccator АЛ5.883.028; 16 — cover АЛ8.046.118; 17 — gasket АЛ8.684. 188; 18 — screw cap АЛ8.632.085; 19 — bushing АЛ8.223.417; 20 — catch АЛ8.262.072; 21 — cover АЛ6.178.017; 22 — bracket АЛ18.080.251; 23 — screw АЛ7.333.013; 24 — handle АЛ8.337.043; 25 — catch АЛ8.262.088; 26 — handle АЛ8.333.205; 27 — regulation unit АЛ5.064.010; 28 — storage battery АЛ5.529.003; 29 — contact spring АЛ7.730.024; 30 — post АЛ8.l20.445; 31 — block АЛ7.830.070; 32 — contact spring АЛ7.730.025; 33 — screw А1.М2-6g×6.32 ЛС59-1.036 ГОСТ 17473—80;



34 — screw M2,5-6g×3.58.016 ГОСТ 1476-75; 35 — ring АЛ8.24l.878; 36 — screw M2,5-6g×3.58.016 ГОСТ 1476-75; 37 — lens АЛ7.538.024; 38 - screw M2,5-6g×3.58.016 ГОСТ 1476-75; 39 — mount АЛ8.637.499; 40 — lens with prism АЛ5.938.174; 41 — mount АЛ8.637.500; 42 — mount АЛ9.317.109; 43 — lens АЛ7.566.067; 44 — mount АЛ9.3l7.110; 45 — lens АЛ7.533.052; 46 — converter АЛ5.305.015; 47 — cover АЛ8.050.270; 48 — shock absorber АЛ8.639.020; 49 — mount АЛ8.637.505; 50 — ring АЛ8.240.543; 51 — clamp АЛ6.272.047; 52 — ring АЛ8.24l.880; 53 — mount АЛ8.637.506; 54 — eye shield АЛ8.647.104; 55 — lens АЛ7.504.247; 56 — lens АЛ5.932.081; 57 — plug АЛ8.656.082; 58 — gasket АЛ8.684.140-01; 59 — h-v unit АЛ5.087.030; 60 — adjusting mechanism АЛ6.063.109; 61 — lens АЛ5.930.407; 62 — screw M3-6g×10.58.016 ГОСТ 1477-75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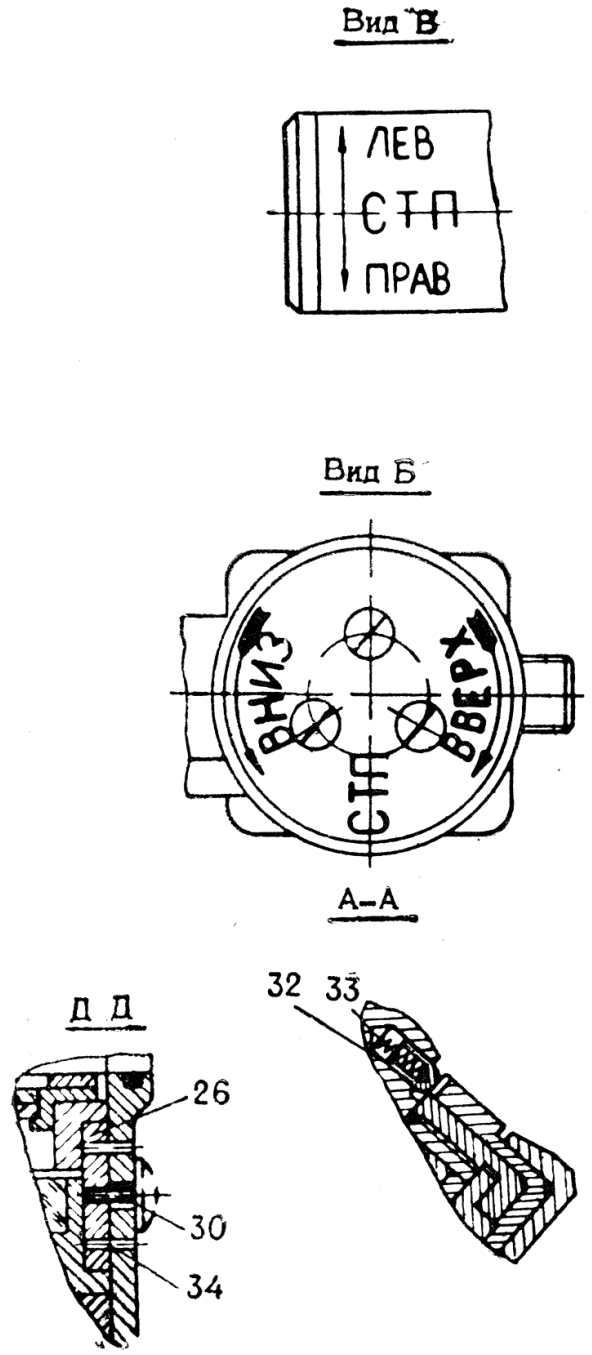

Fig. 8. **Adjusting Mechanism АЛ6.063.109:**

1 — guide ЛЕВ, СТП, ПРАВ (LEFT, MSP, RIGHT) АЛ8.203.349; 2 — nut АЛ8.934.259; 3 — bushing АЛ8.220.323; 4 — stop АЛ8.362.092; 5 — spring АЛ8.385.031; 6 — guide АЛ8.203.347; 7 — body АЛ8.020.689; 11 — washer АЛ7.723.000; 12 — contact АЛ6.622.002; 13 — strap АЛ8.600.922; 14 — reticle АЛ5.937.173; 15 — prism АЛ5.935.223; 16 — spring АЛ8.383.527; 17 — guide АЛ8.203.348; 18 — pin АЛ8.960.051; 19 — nut АЛ8.934.260; 20 — screw АЛ6.328.101; 21 — scale АЛ7.025.078, АЛ7.025.078-02, АЛ7.025.078-03, АЛ7.025.078-04, АЛ7.025.078-05 (a set of scales per sight); 22 — screw A1.M2-6g×5.58.016 ГОСТ 17474—80; 23 — knob ВВЕРХ СТП, ВНИЗ (UP, MSP, DOWN) АЛ8.330.010; 24 — limiter АЛ8.366.335; 25 — limiter АЛ8.366.334; 26 — key АЛ8.977.036; 27 — dog АЛ8.344.056; 28 — prism АР-90° АЛ7.200.082; 29 — lens АЛ5.930.408; 30 — screw М2-6g×4.58.016; 31 — casing АЛ8.020.409; 32 — stop АЛ8.362.093; 33 — spring АЛ8.383.528; 34 — pin $1C_3$×4.016 ГОСТ 3128—70

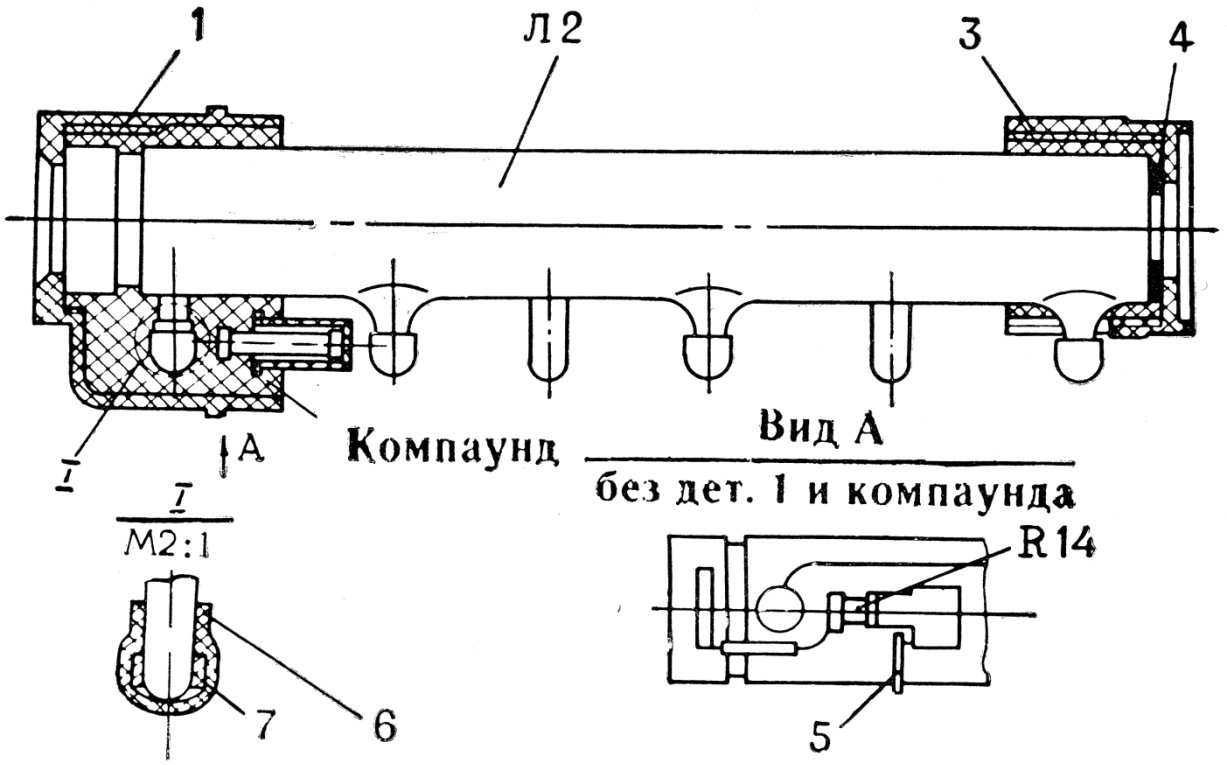

Fig. 9 **Converter АЛ5.305.014:**

1 — casing АЛ8.020.407; 3 — cap АЛ7.850.009; 4 — diaphragms АЛ8.266.05l, АЛ8.266051-01, -02, -03, -04, -05; 5 — contact bar; 6 — cap АЛ7.850.008; 7 — contact bar АЛ7.732.456

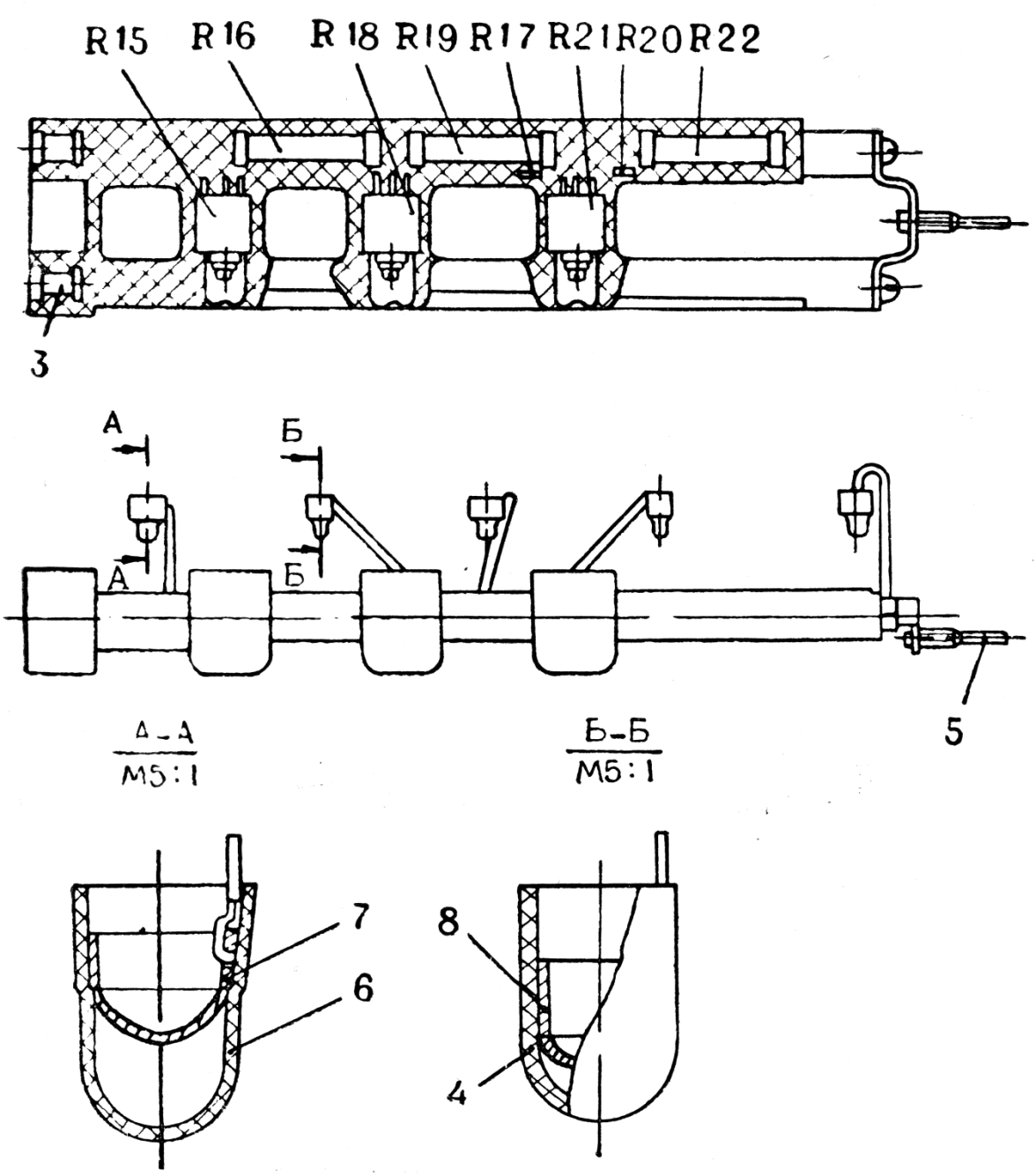

Fig. 10. **Divider АЛ5.171.009:**

3 — bushing АЛ8.227.604; 4 — cap АЛ8.850.008; 5 — contact АЛ7.732.268; 6 — cap АЛ8.634.019; 7 — cap АЛ7.742.003; 8 — contact АЛ7.732.456

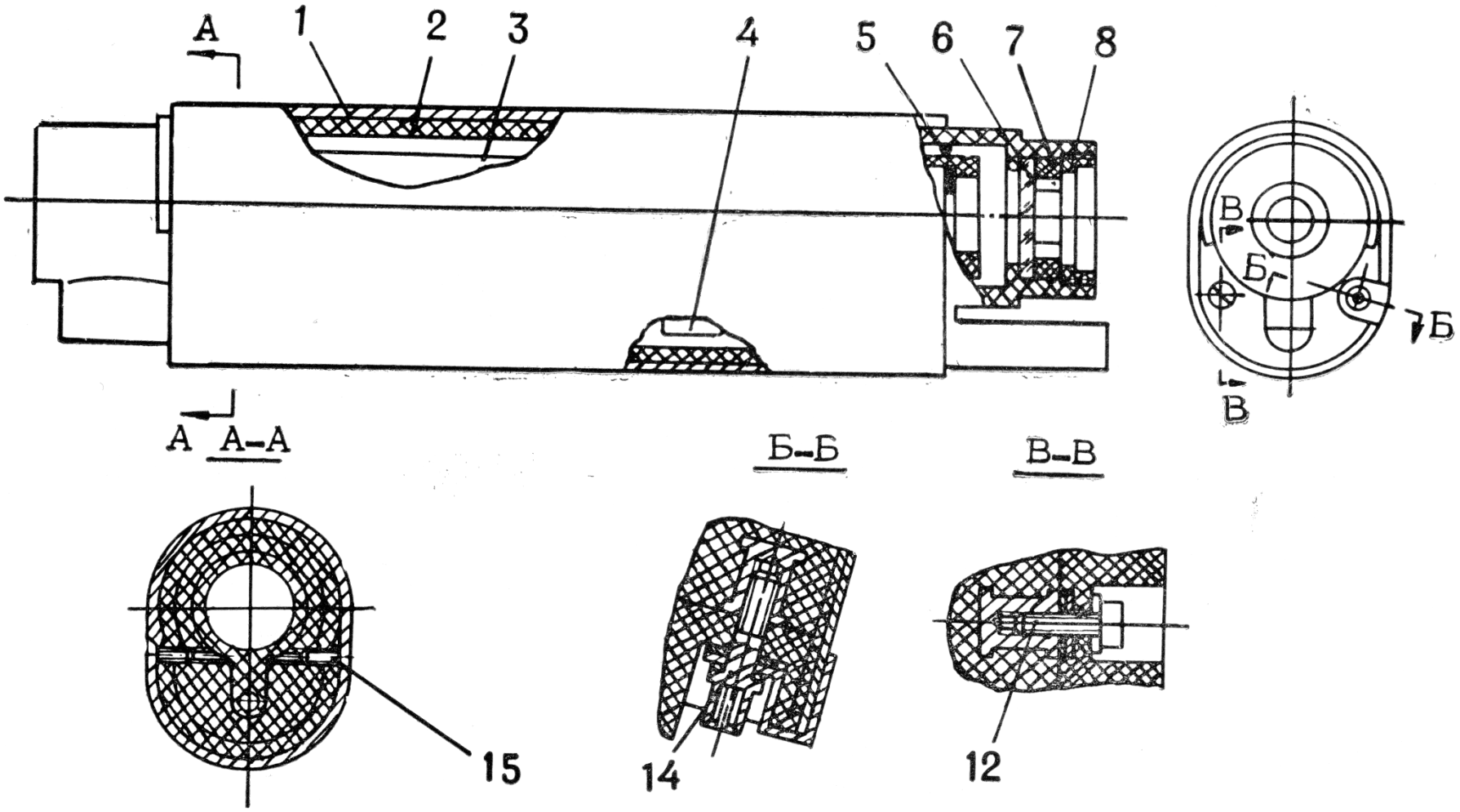

Fig. 11. **Converter АЛ5.305.015:**

1 — screen АЛ6.628.011; 2 — casing АЛ8.634.328; 3 — converter АЛ5.305.014; 4 — divider АЛ5.171.009; 5 — shock absorber АЛ8.639.019; 6 — protective glass АЛ8.640.163; 7 — photoresistor АЛ5.641.006;8 — ring АЛ8.241.879; 12 — screw А.М3-6g×8.58.016 ГОСТ 1491—80; 14 — contact АЛ7.372.269; 15 — screw А1.М2,5-6g×8.58.016 ГОСТ 17475—80

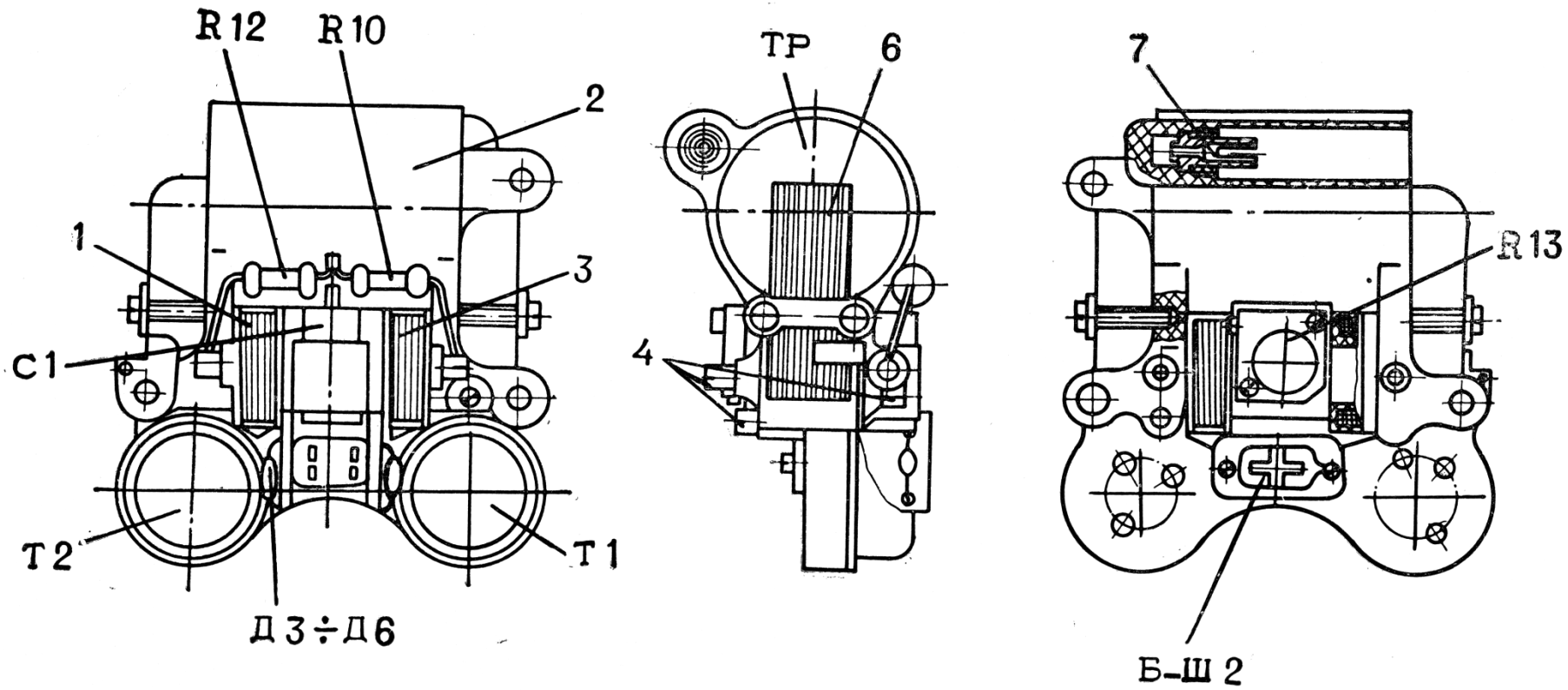

Fig. 12. **Voltage converter АЛ5.087.031**

1 — base coil АЛ5.760.068; 2 — body АЛ8.020.406; 3 — collector coil АЛ5.760.067; 4 — pin АЛ8.126.174; 6 — plate АЛ7.777.010; 7 — contact АЛ7.732.275

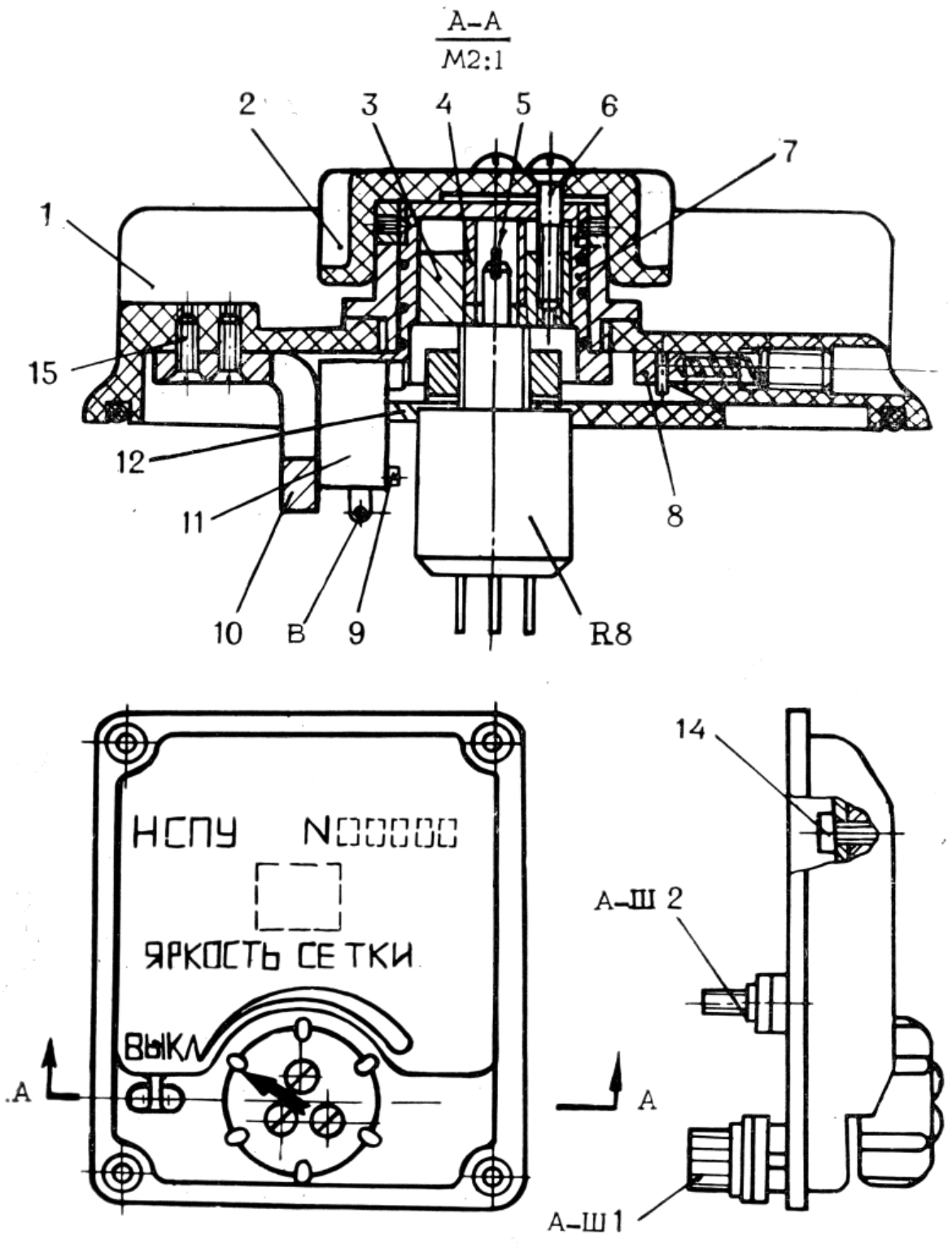

Fig. 13. **Regulation Unit АЛ5.064.010:**

1 — cover АЛ80.040.121; 2 — knob ЯРКОСТЬ СЕТКИ, ВЫКЛ (RETICLE BRIGHTNESS, OFF) АЛ8.330.009 (R8, B); 3 — bushing АЛ8.220.322; 4 — ring АЛ8.240.542; 5 — cotter pin АЛ8.978.007; 6 — screw В1.М2-6g×14.58.016 ГОСТ 17473—80; 7 — cap АЛ8.634.329; 8 — stop АЛ8.362.093; 9 — screw АЛ8.900.270; 10 — post АЛ8.121.006; 11 — pusher АЛ8.352.149; 12 — plate АЛ7.814.244; 14 — screw А.М2-6g×5.58.013 ГОСТ 1491—80; 15 — screw А1.М2-6g×6.58.016 ГОСТ 17475—80

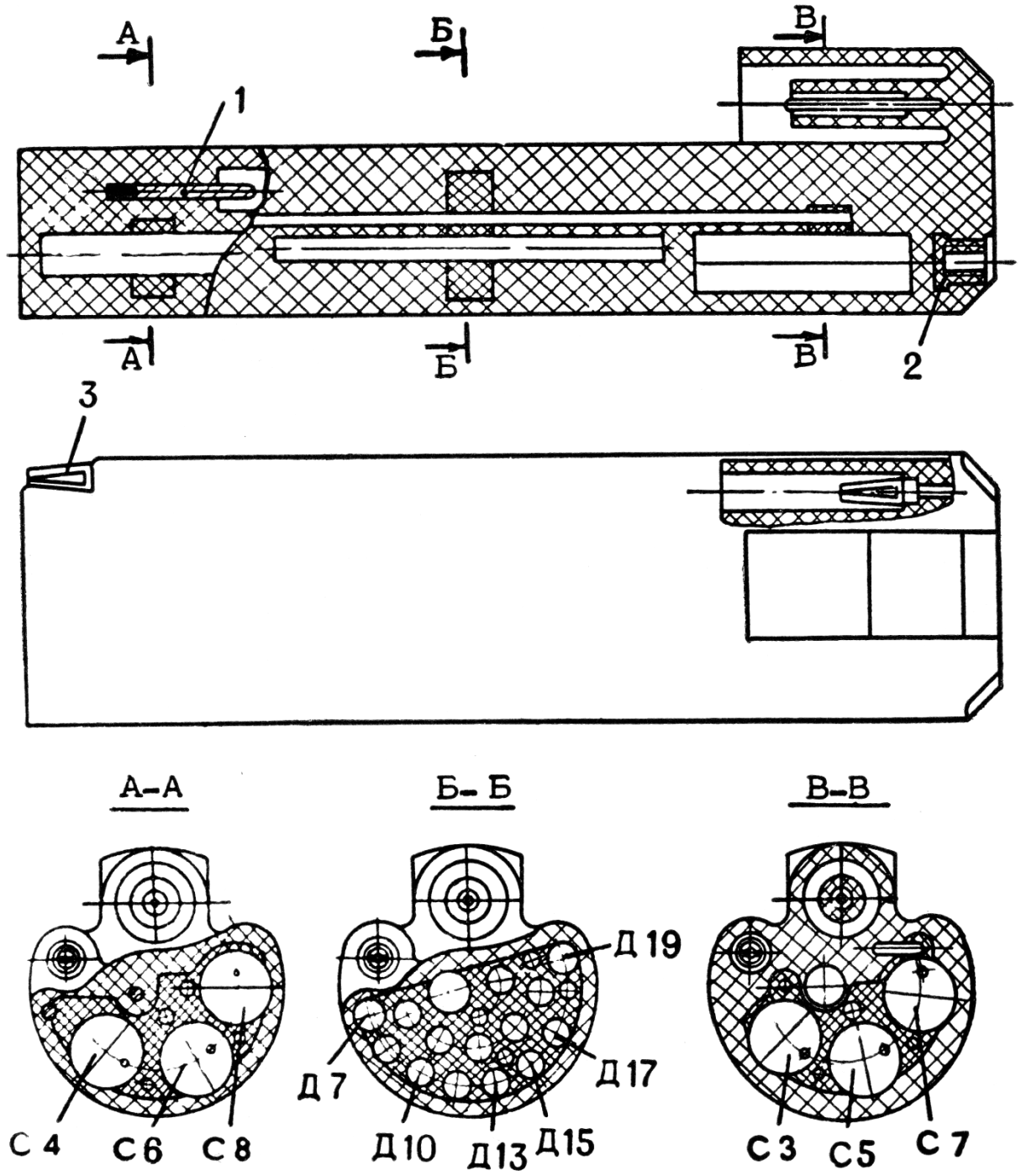

Fig. 14. **H-V Unit АЛ5.087.030:**

1 — contact АЛ7.732.272; 2 — bushing АЛ8.227.605; 3 — contact АЛ7.732.271

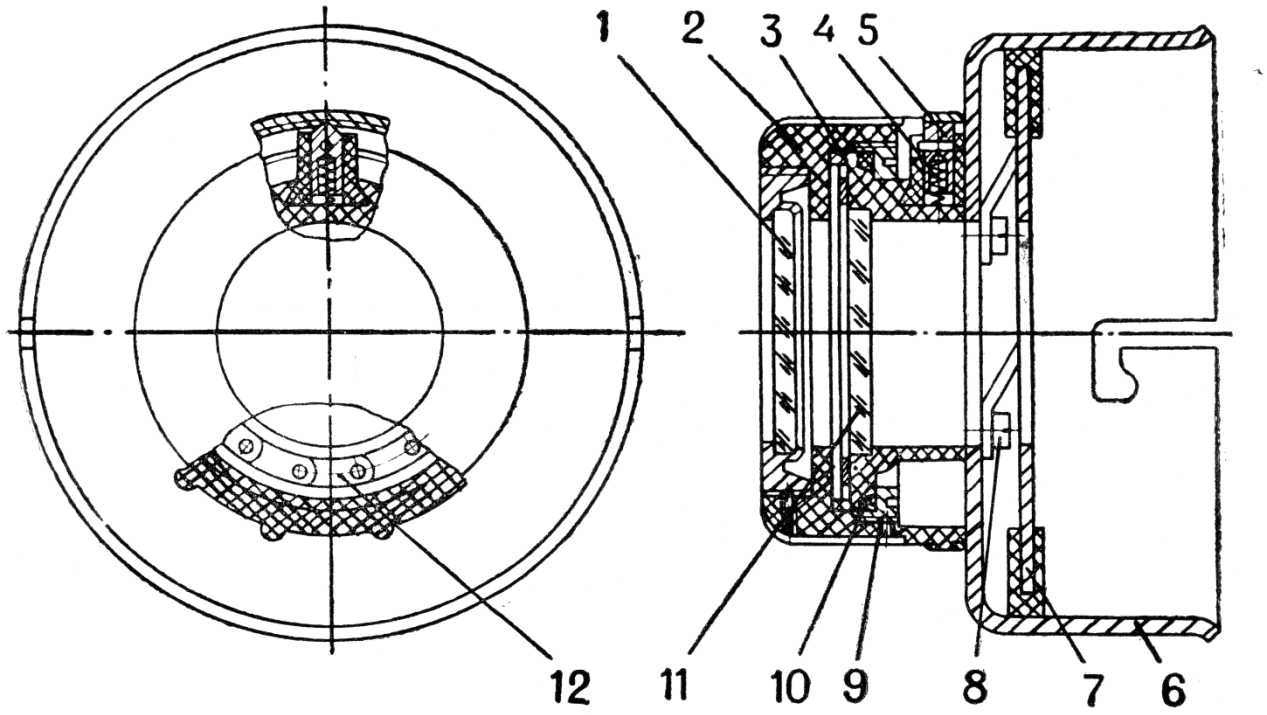

Fig. 15. **Diaphragm АЛ6.724.029:**

l — filter АЛ5.940.138; 2 — body АЛ6.116.006; 3 — mount АЛ8.637.510; 4 — spring АЛ8.383.528; 5 — stop АЛ8.362.093; 6 — casing OPEN, CLOSE АЛ8.030.026; 7 — clamp АЛ6.385.010; 8 — screw А.М3-6g×8.58.016 ГОСТ 1491—80; 9 — ring АЛ8.240.547; 10 — O-ring АЛ8.235.125; 11 — Filter АЛ7.226.015; 12 — blade АЛ5.962.002

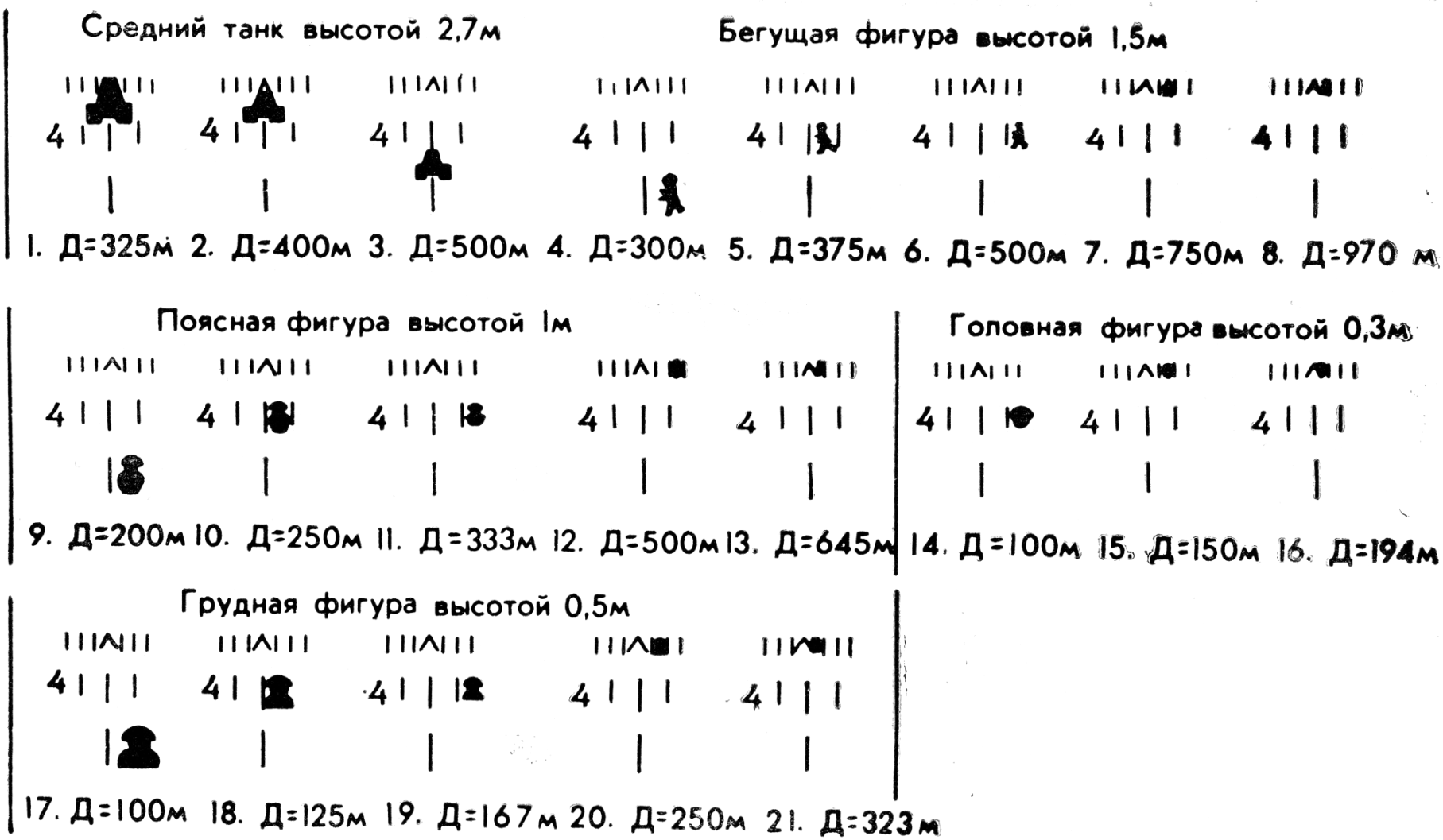

Fig. 16. **Ranging by means of the reticle**

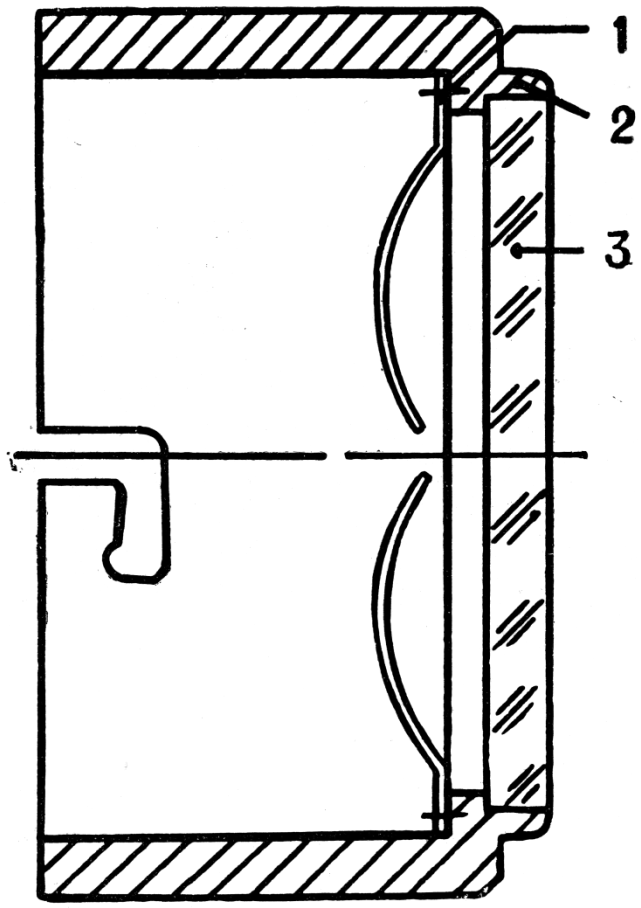

Fig. 17. **Filter АЛ5.940.139:**

1 — spring АЛ8.387.179; 2 — mount АЛ8.637.511; 3 — filter АЛ7.220. 178

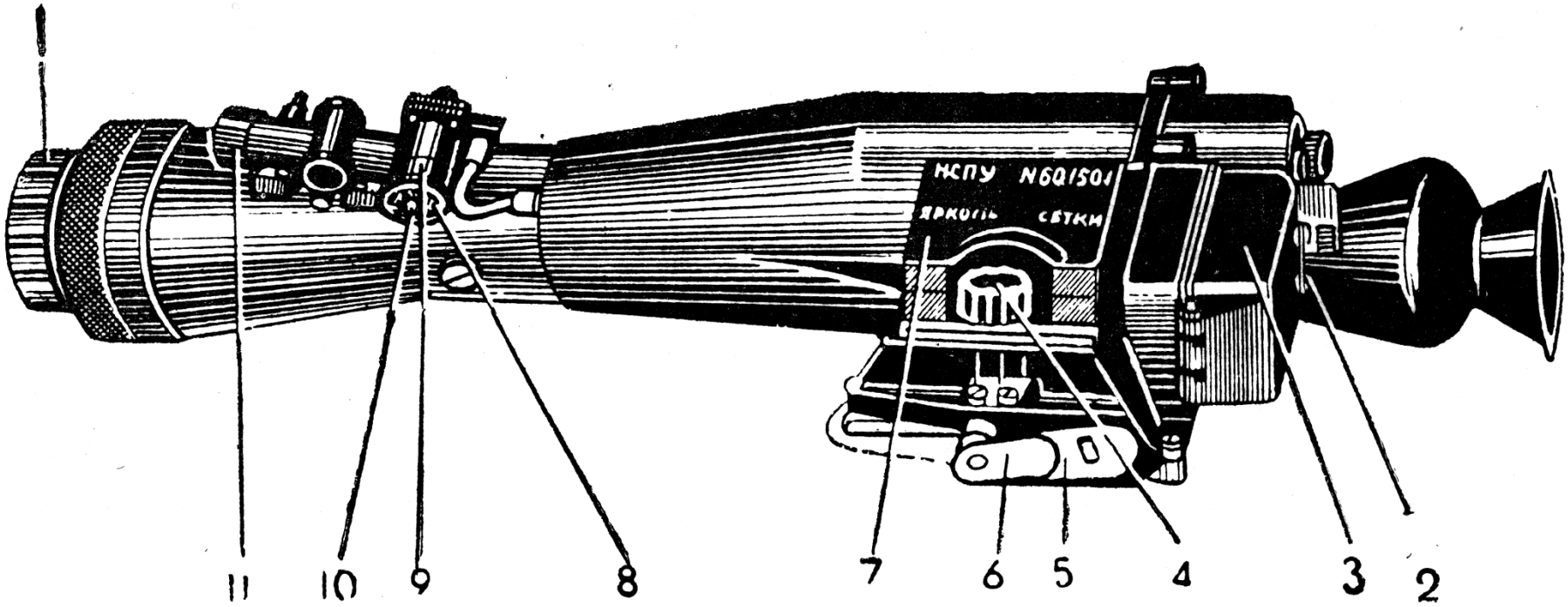

Fig. 18. **External view of the sight**

1 — diaphragm АЛ4.274.029; 2 — catch АЛ8.262.072; 3 — cover АЛ6.178.017; 4 — knob RETICLE BRIGHTNESS, OFF АЛ8.330.009 (R8, B); 5 — handle АЛ8.337.043; 6 — catch АЛ8.262.088; 7 — cover АЛ8.040.121; 8 — knob UP, MSP, DOWN АЛ8.330.010; 9 — scale АЛ7.025.078, АЛ7.025.078-02, АЛ7.025.078-03, АЛ7.025.078-04, АЛ7.025.078-05 (a set of scales per sight); 10 — screw A1.M2-6g×5.58.016 ГОСТ 17474—80; 11 — guide LEFT, RIGHT, MSP АЛ8.203.349

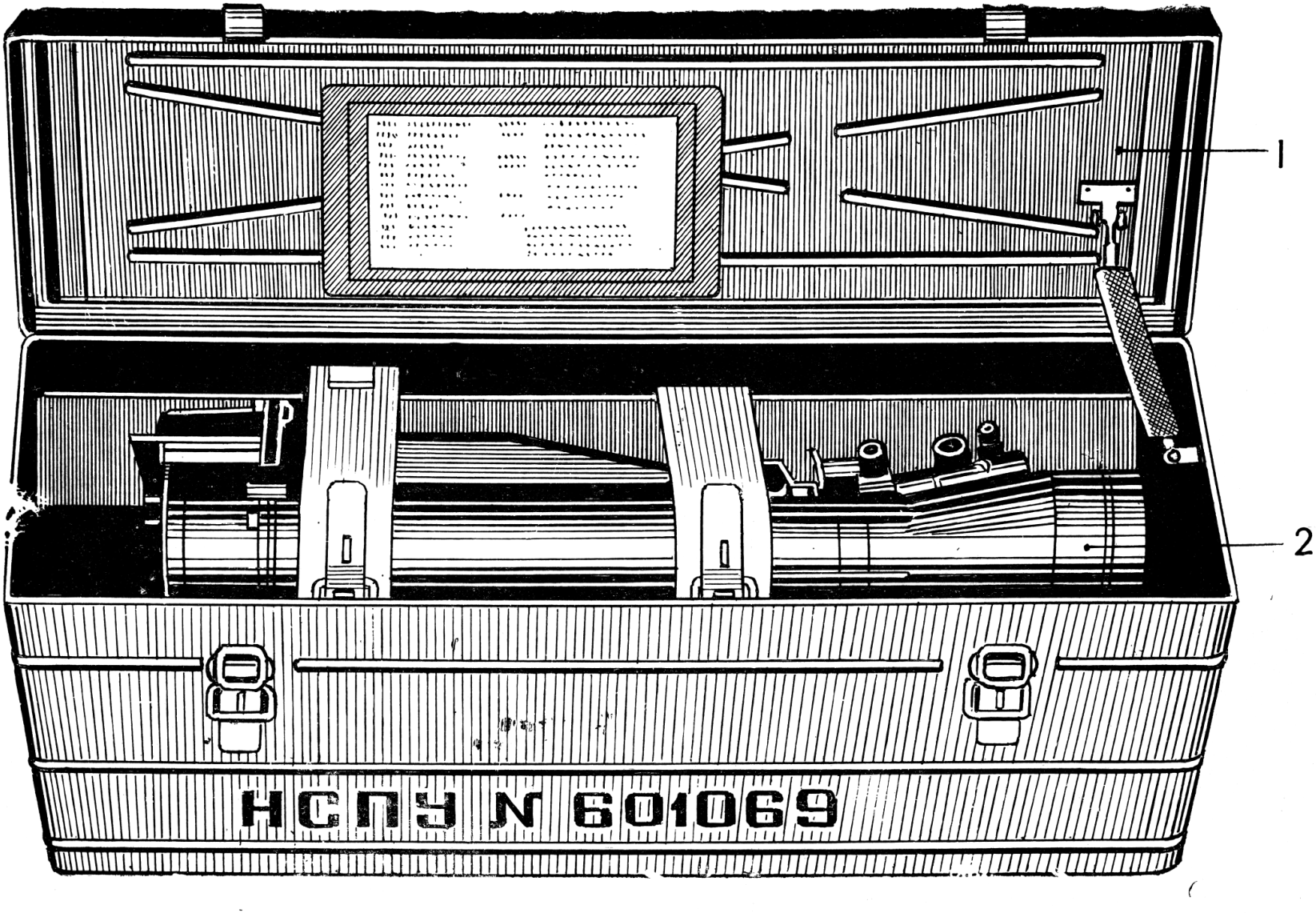

Fig. 19. **Sight Packing Case:**
1 — packing case АЛ4.161.237; 2 — sight article NSPU АЛ3.812.033

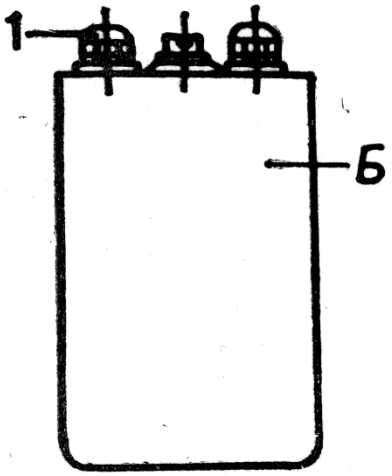

Fig. 20. **Storage Battery АЛ5.529.003:**

1 — contact АЛ7.732.277

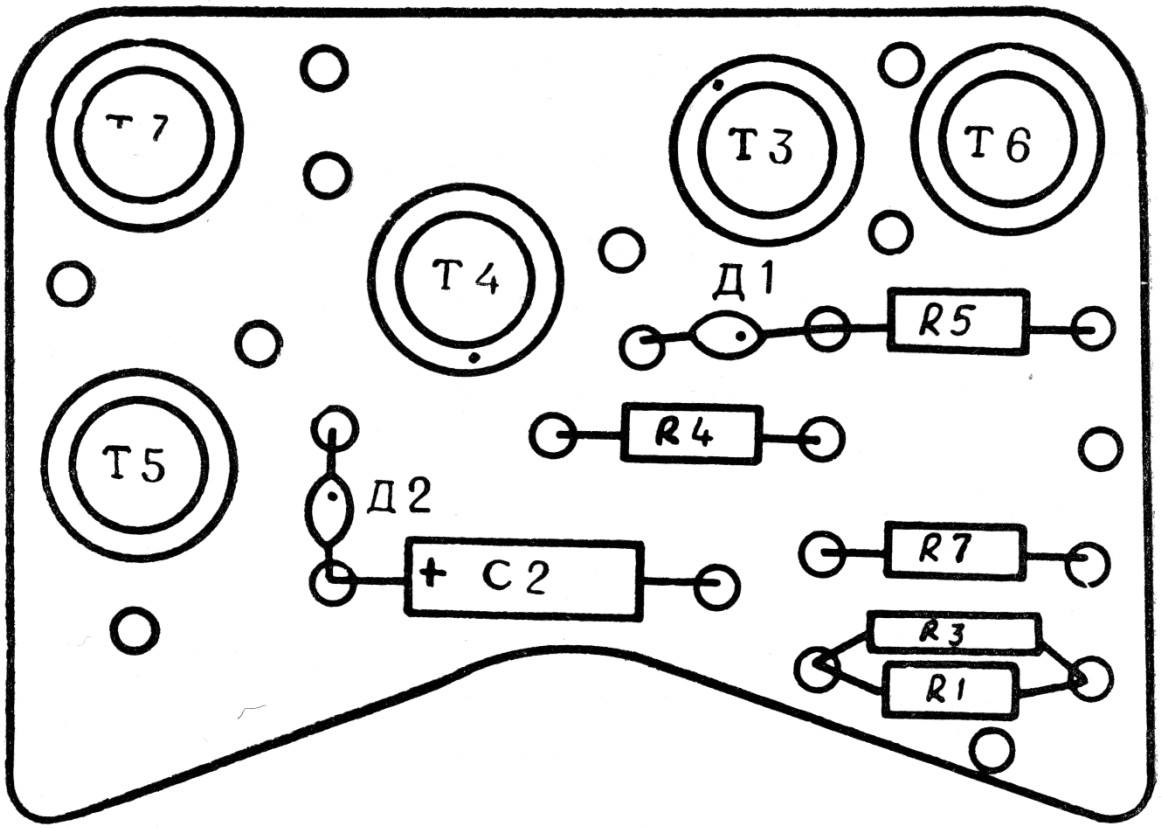

Fig. 21. **Plate**

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