S.P. Burkova, G.F. Vinokurova, R.G. Dolotova

DESCRIPTIVE GEOMETRY AND ENGINEERING GRAPHICS

Bank of tasks of graphic works

Graphic work №1 "Title page"

      Write words GRAPHIC WORKS font 10, capital letters. Arrange an inscription in the center of a sheet, in the sizes specified on a sample
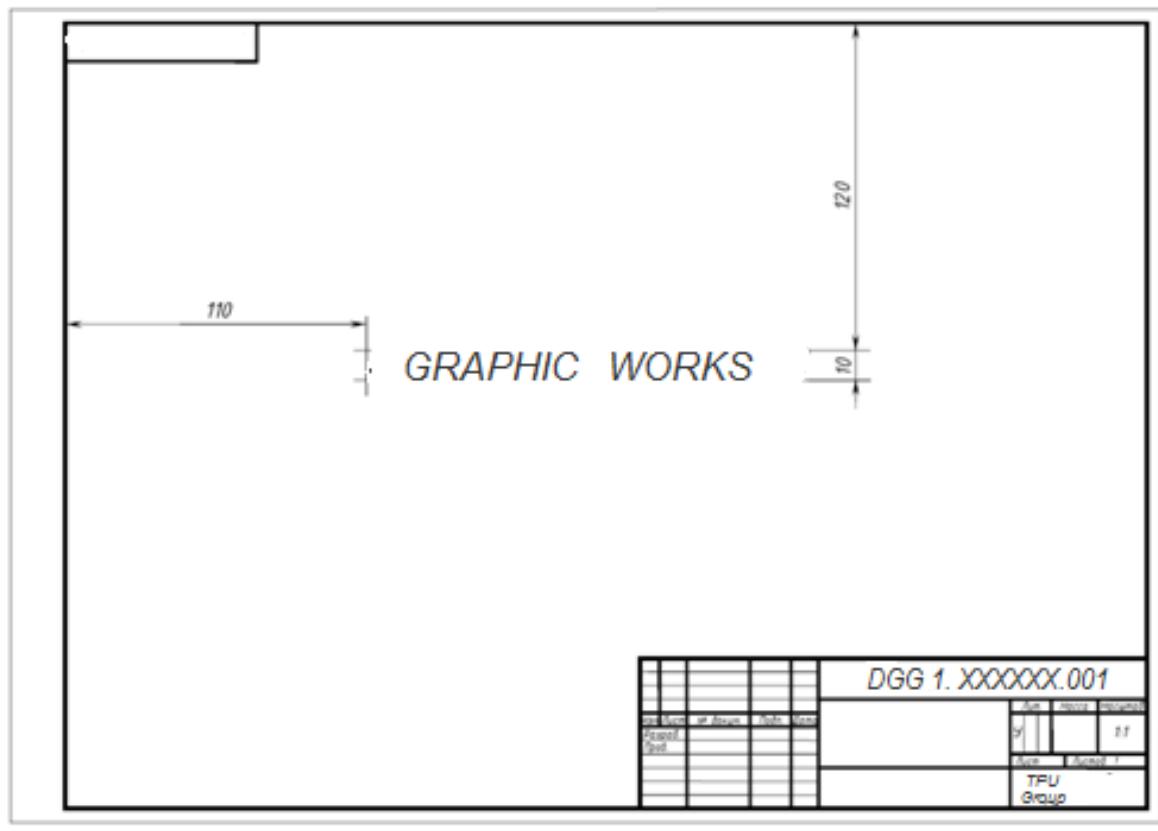
# Graphic work № 2, 3

«Bodies with an aperture»

Task: Construct three projections of a polyhedron and a surface of rotation with an aperture.

Variant 1

1.

2.

Variant 2

1.

$$a'=b' \qquad c' \qquad e' \qquad d'$$
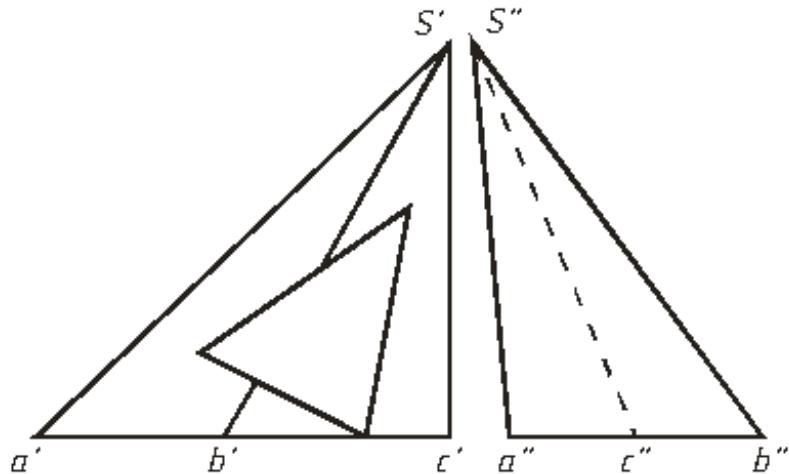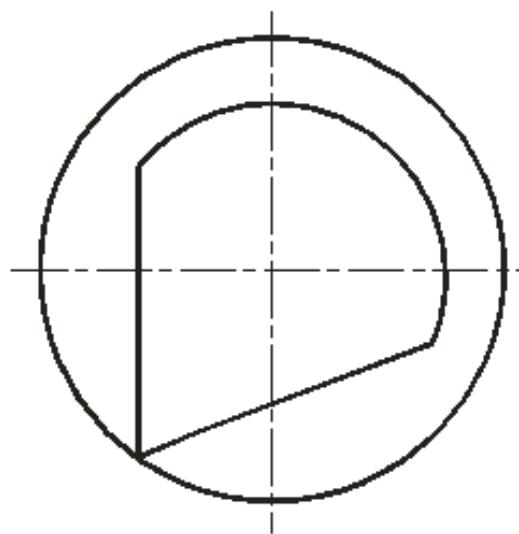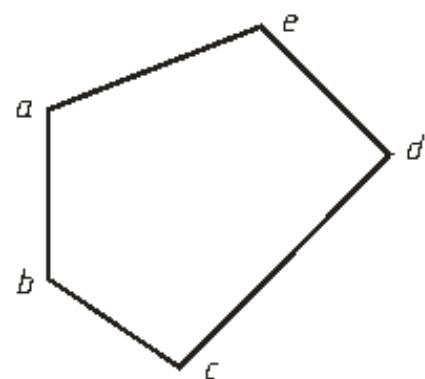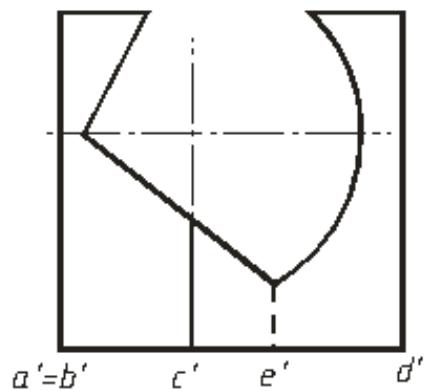
2.
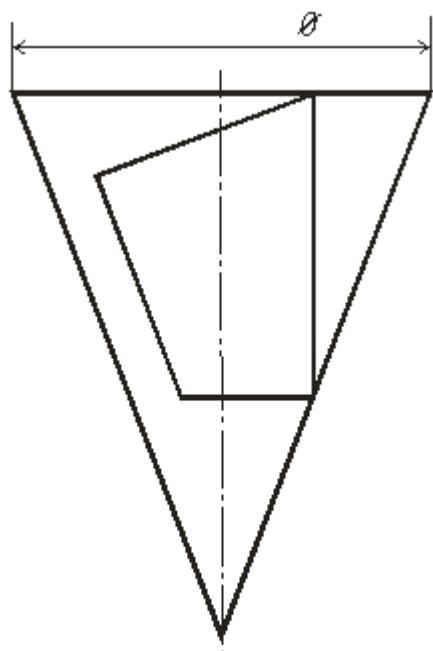
Variant 3

1.
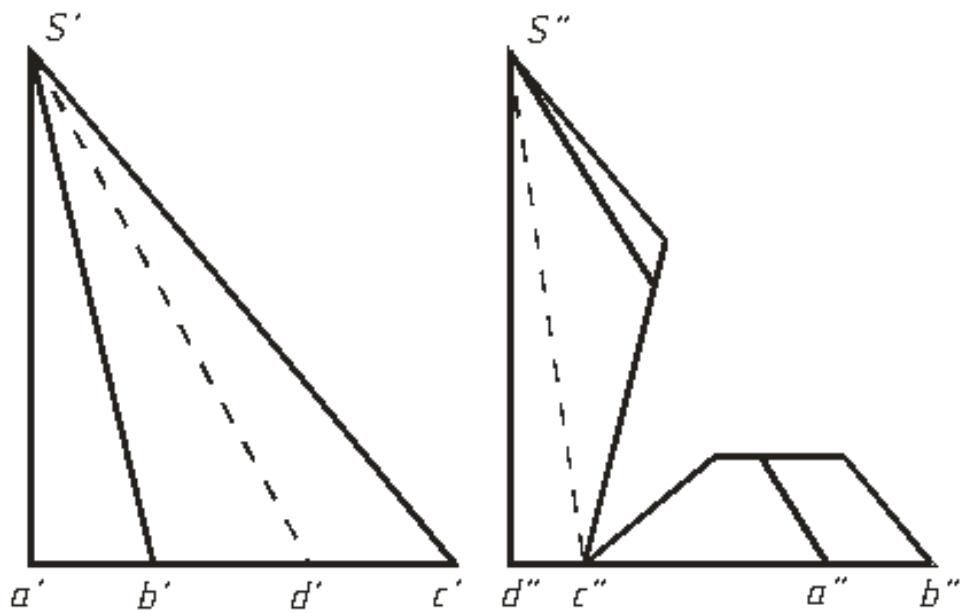
2.
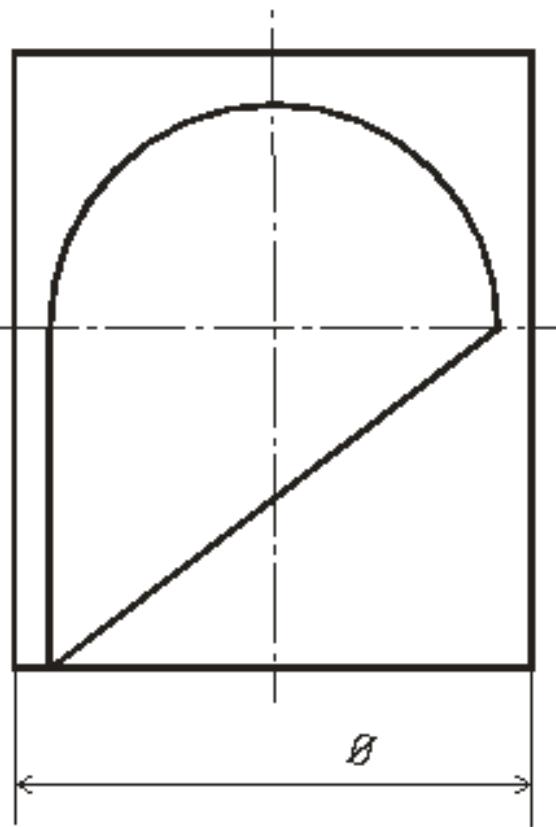
Variant 4

1.
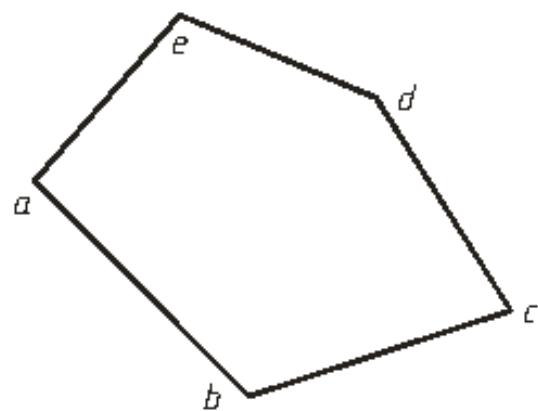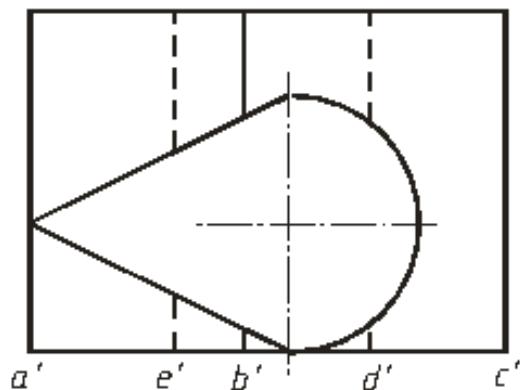
2.
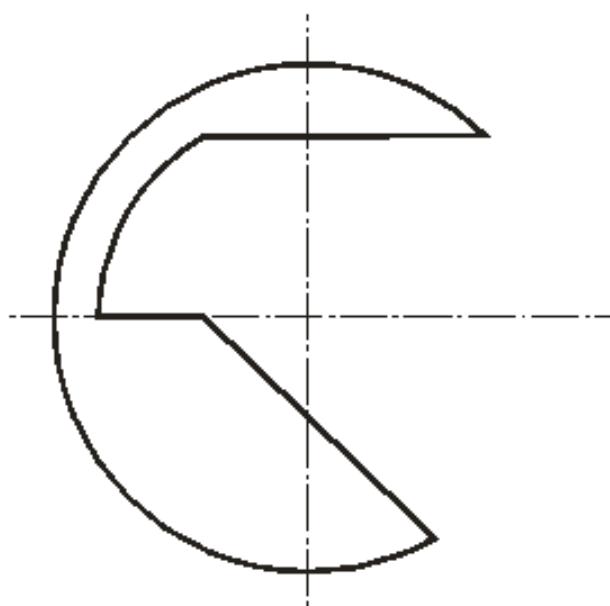
Variant 5

1.
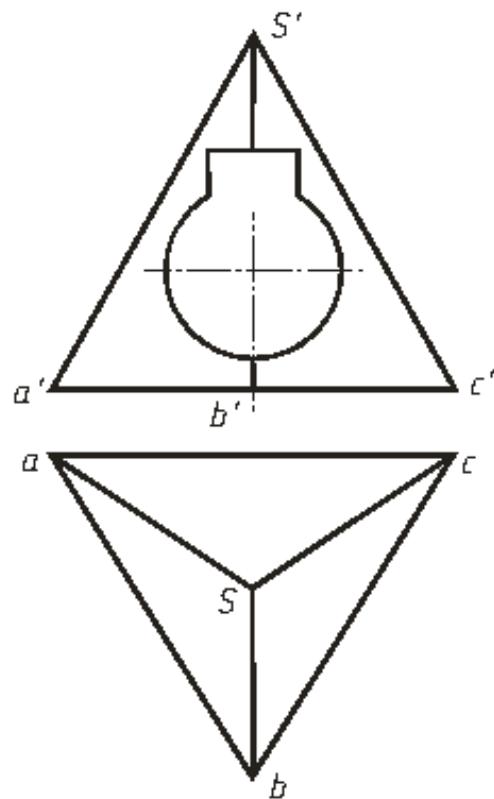
2.
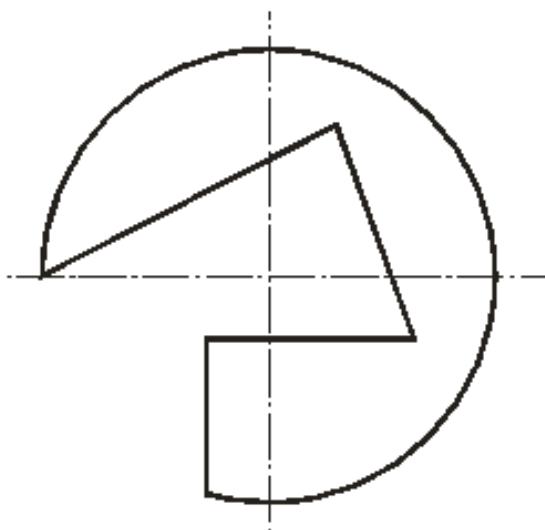
Graphic work № 4

Variant 1

On two given, construct three images of a detail, execute rational sections, put the sizes. Construct sections of a detail the set inclined plane. Construct isometric of a detail.
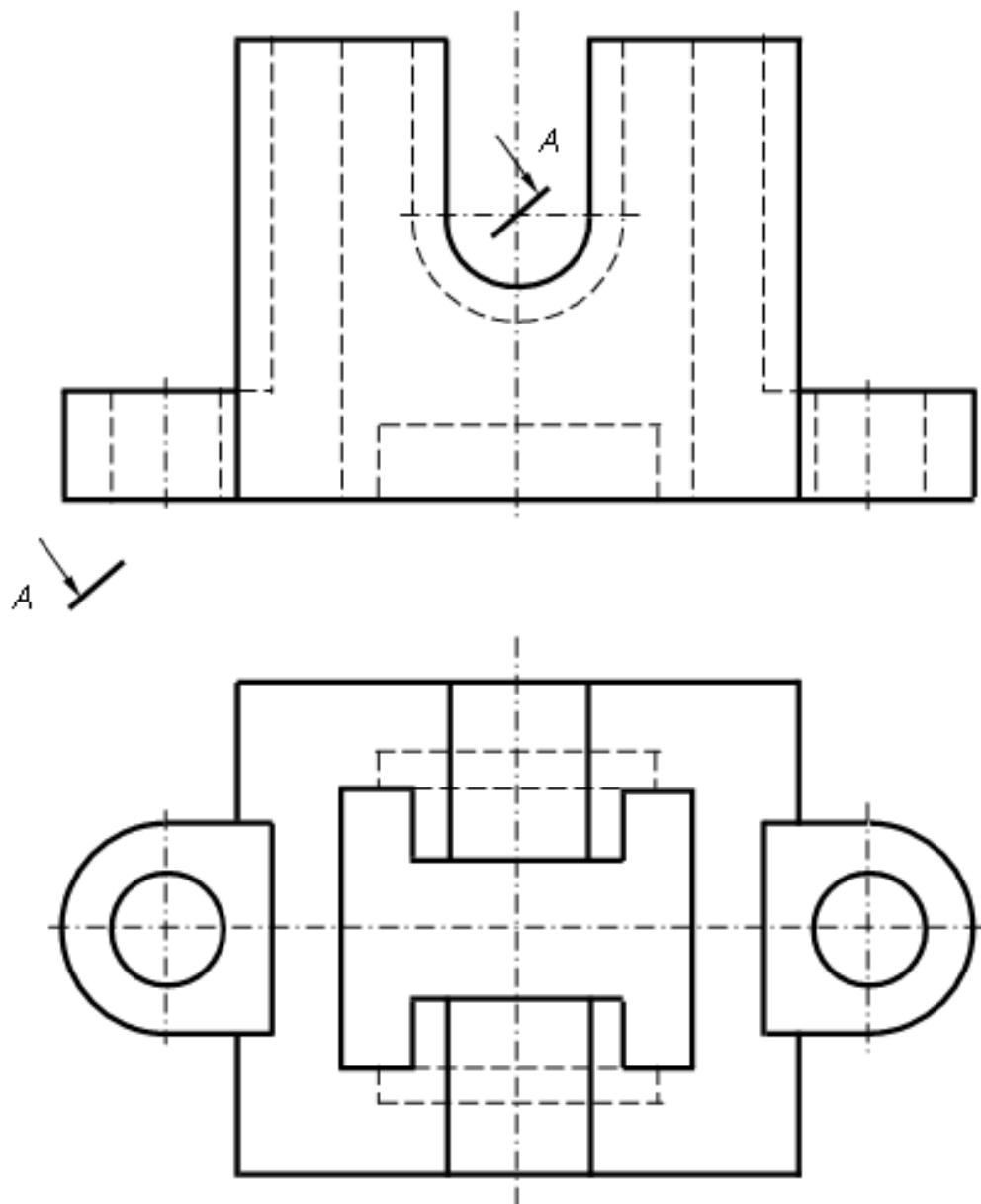
Variant 2

On two given, construct three images of a detail, execute rational sections, put the sizes. Construct sections of a detail the set inclined plane. Construct isometric of a detail.
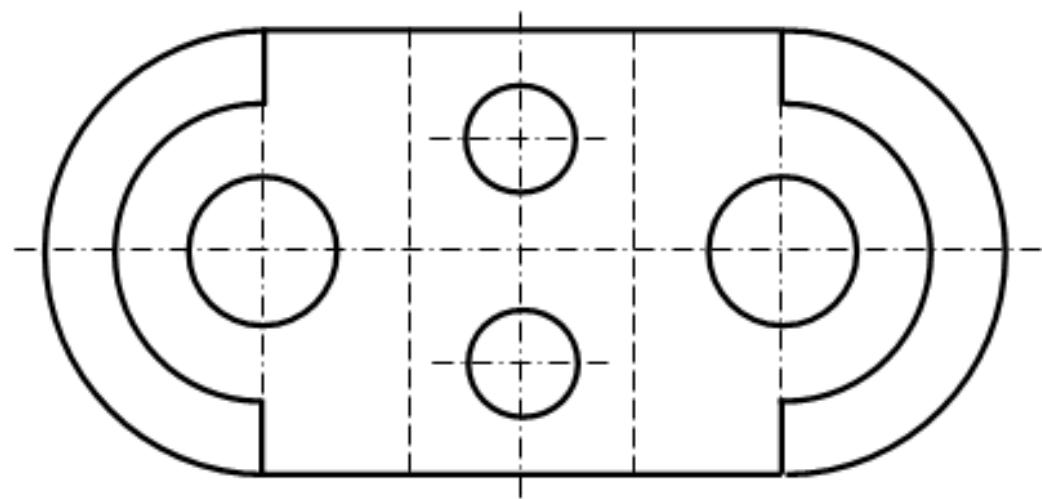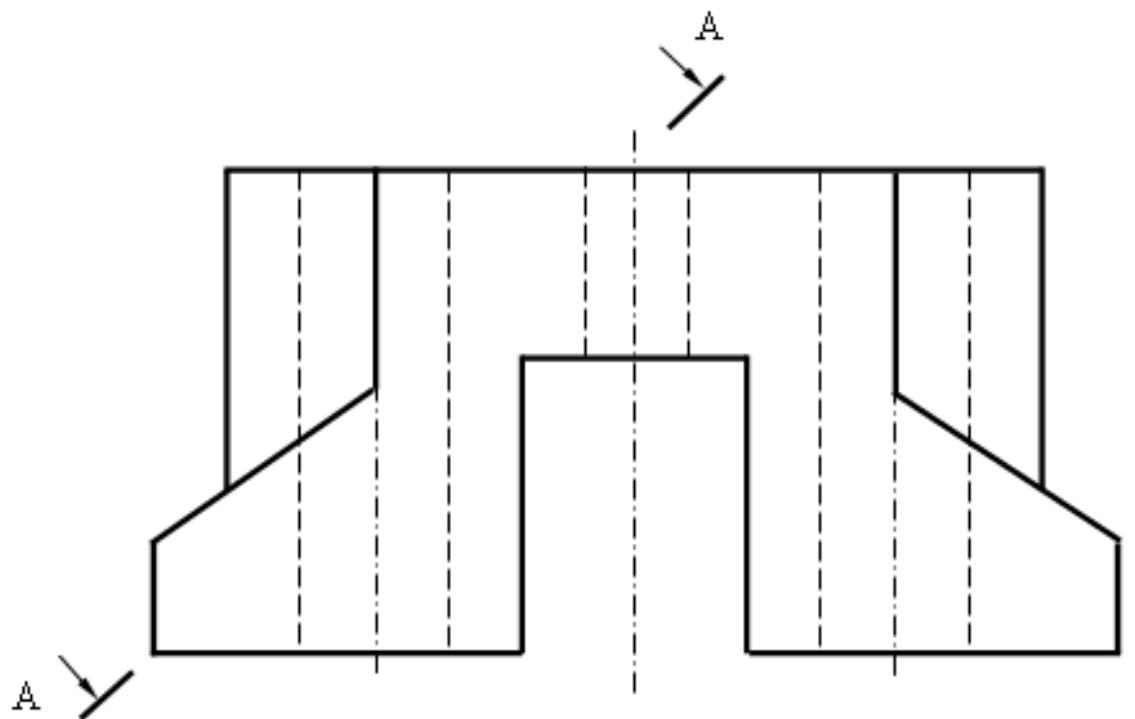
Variant 3

On two given, construct three images of a detail, execute rational sections, put the sizes. Construct sections of a detail the set inclined plane. Construct isometric of a detail.
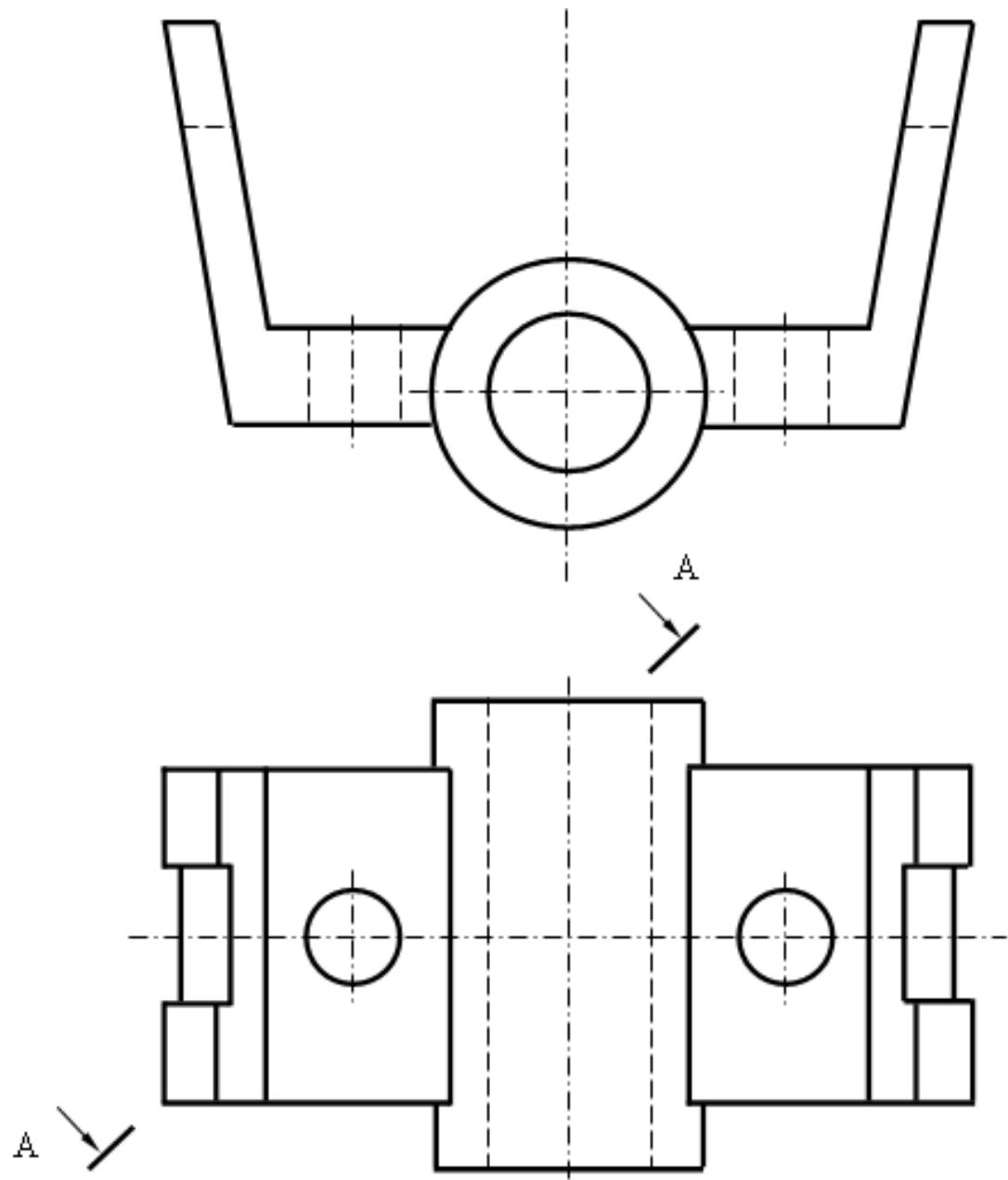
Variant 4

On two given, construct three images of a detail, execute rational sections, put the sizes. Construct sections of a detail the set inclined plane. Construc isometric of a detail.

A

A
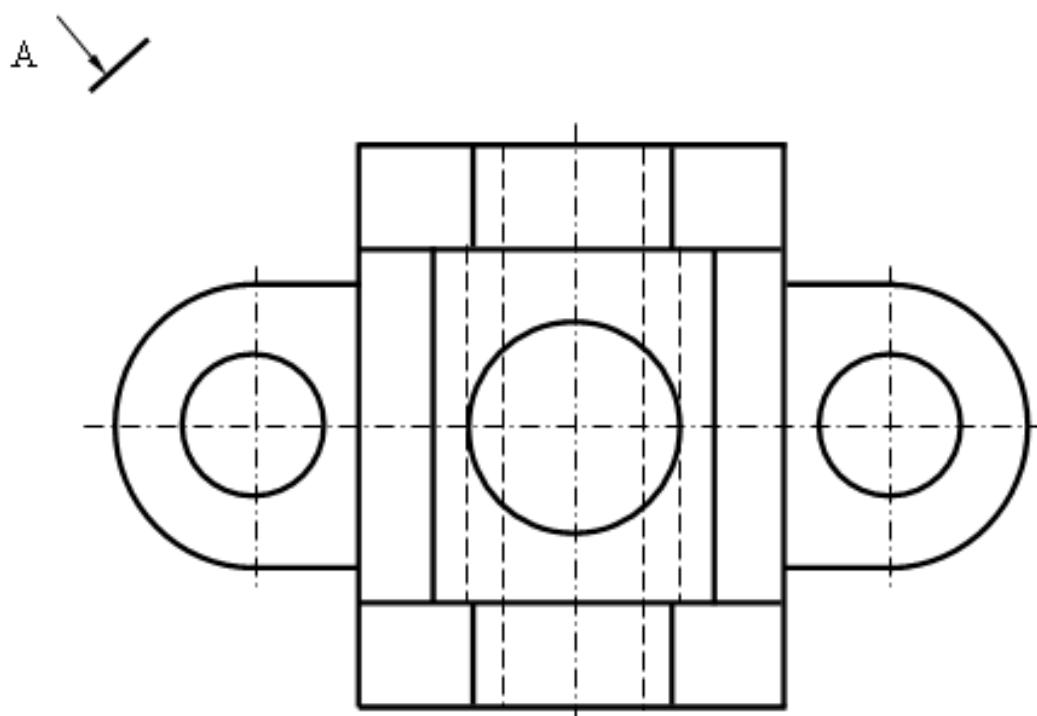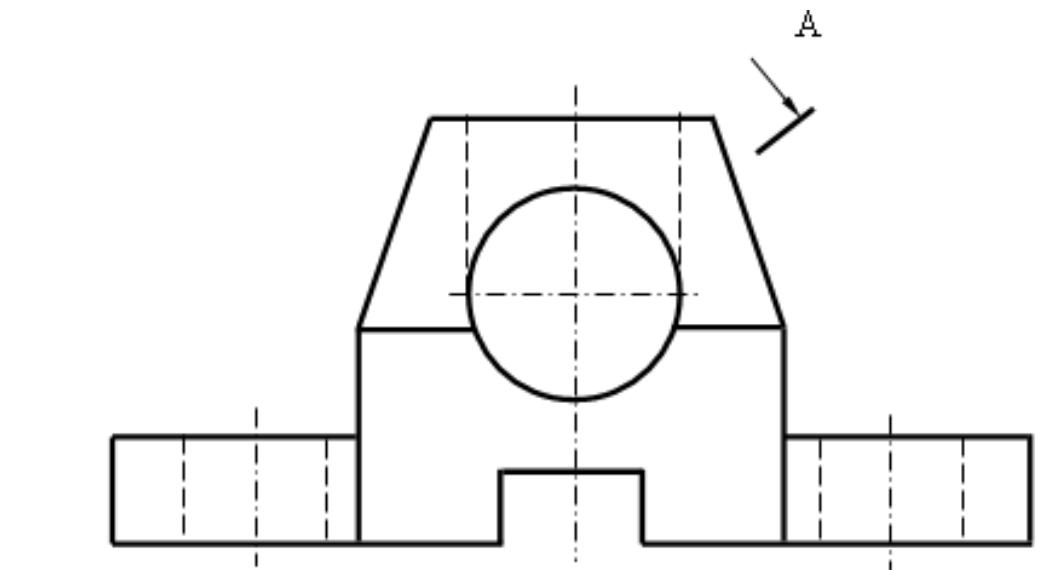
Variant 5

On two given, construct three images of a detail, execute rational sections, put the sizes. Construct sections of a detail the set inclined plane. Construct isometric of a detail.

A

A
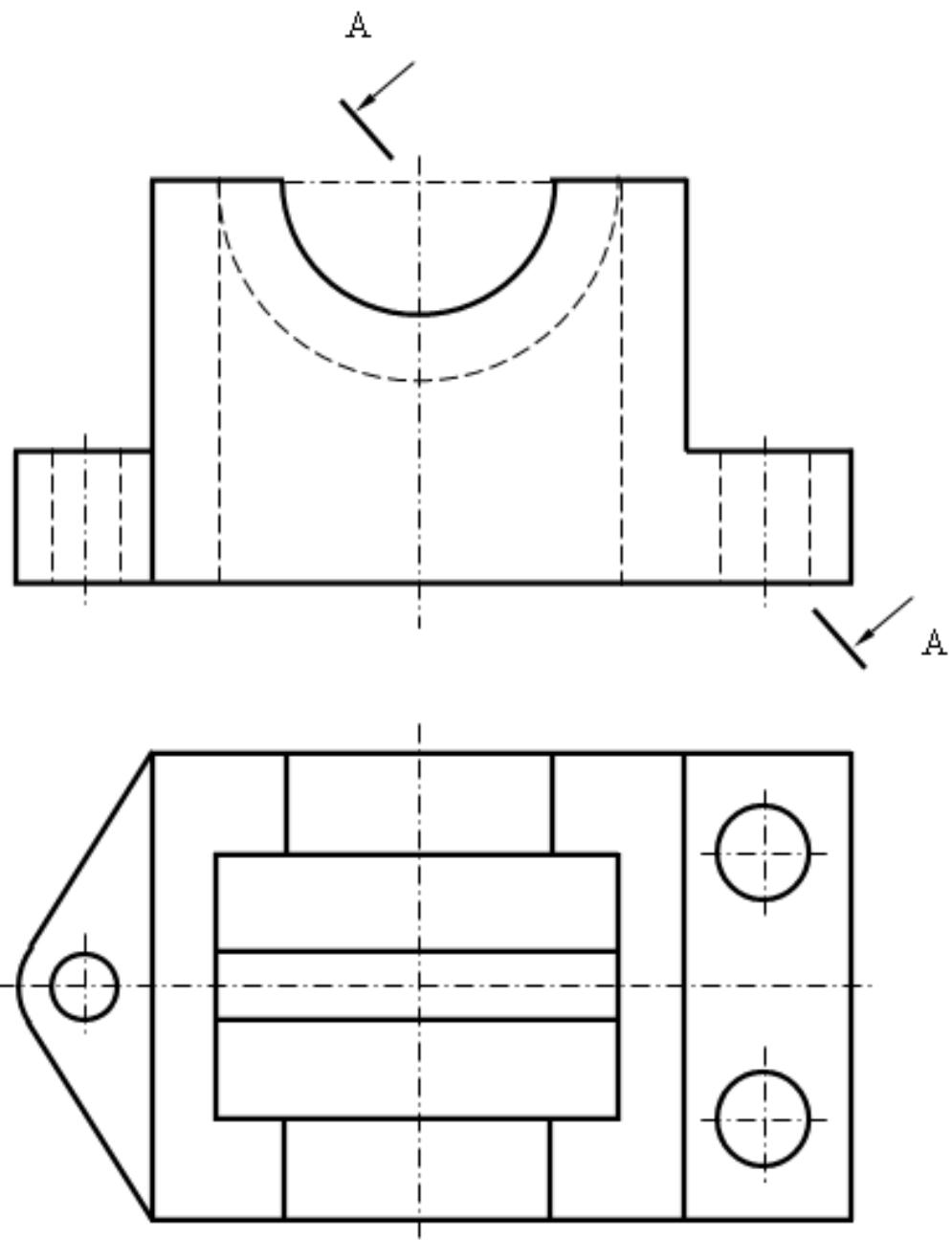
Graphic work № 5

Construct the drawing of connection by a bolt.
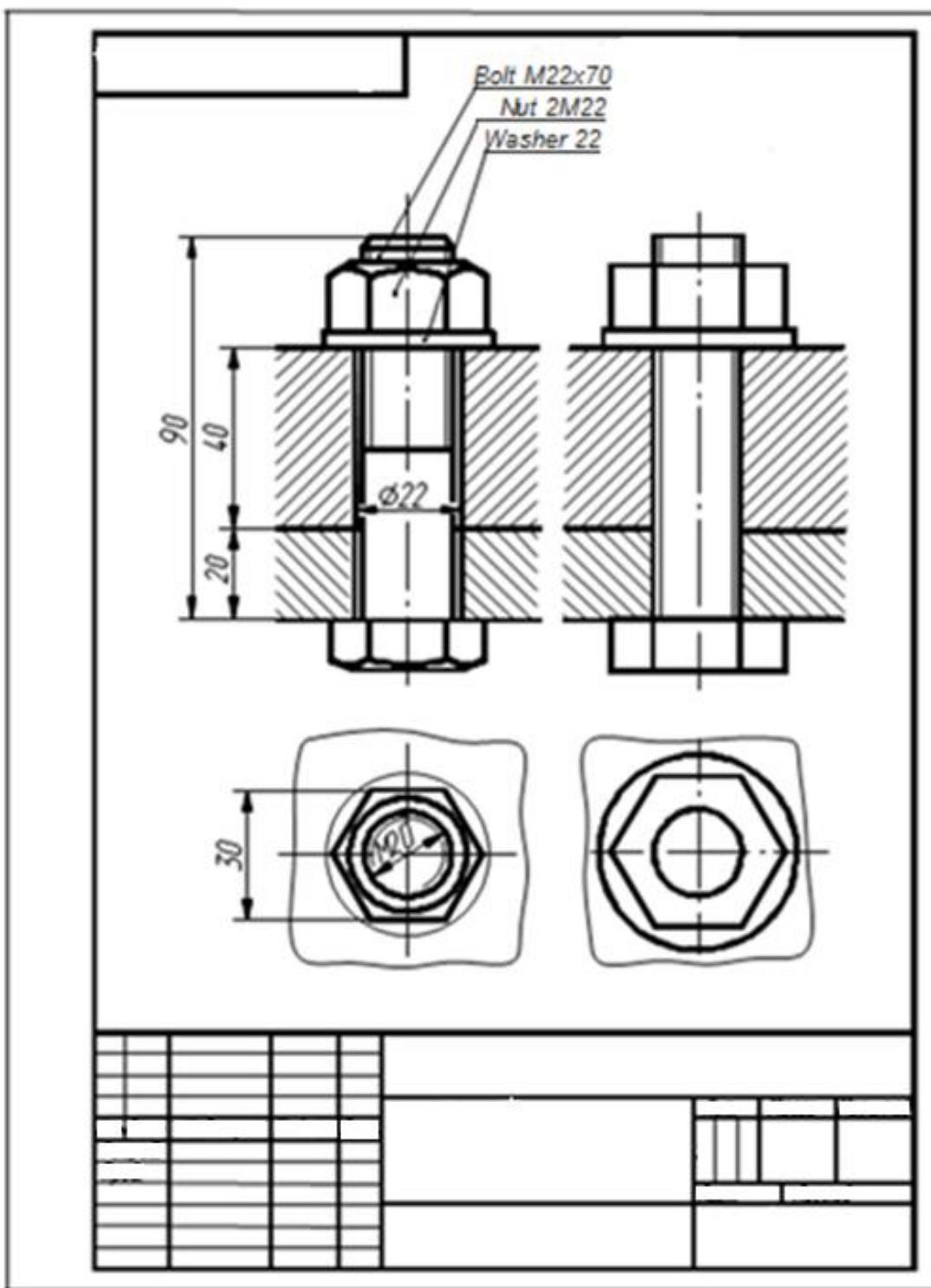
Data to task

Table 1

The Bolted joint						
Variant	Diameter of thread, d	Pitch of thread, p	Thickness of details jointed		Variants	
			l_1	l_2	Nuts	Washers
1	8	1,25	20	14	2	2
2	10	1,5	16	16	1	1
3	12	1,75	20	14	2	1
4	16	2	24	15	2	2
5	20	2,5	25	20	1	1

Table 2

Diameter of thread , d	8	10	12	16	20	30	36	42
Pitch of thread , P	1,25	1,5	1,75	2	2,5	3,5	4	4,5
Width across flats, S	13	17	19	24	30	46	55	65
Height of bolt head, H	6,5	8	10	13	16	24	29	34
Diameter of described circle, D	14,2	18,7	20,9	26,5	33,3	50,9	60,8	72,1
Length of bolt, l	Length of thread, l_0							
45	22	26	30	38	×	×	-	-
50	22	26	30	38	×	×	×	-
55	22	26	30	38	46	×	×	×
60	22	26	30	38	46	×	×	×
65	22	26	30	38	46	×	×	×
70	22	26	30	38	46	×	×	×
75	22	26	30	38	46	66	×	×
80	22	26	30	38	46	66	×	×
90	22	26	30	38	46	66	78	×
100	22	26	30	38	46	66	78	×
110	22	26	30	38	46	66	78	90
120	22	26	30	38	46	66	78	90
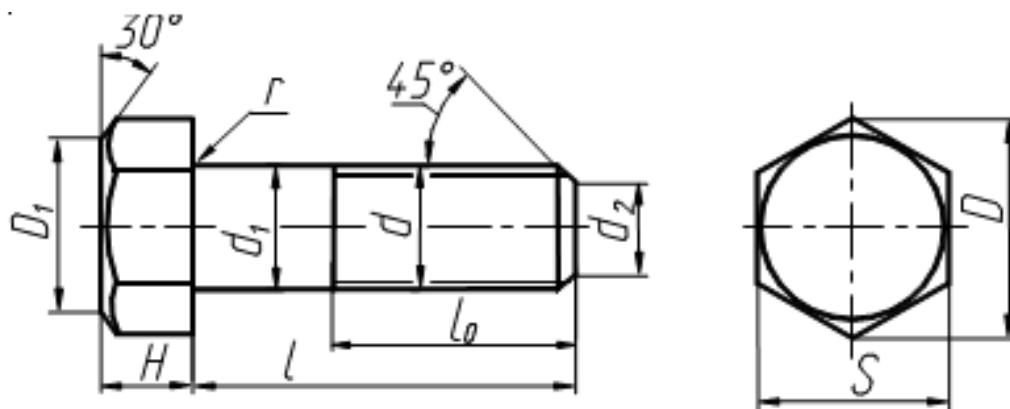
$$D_1 = (0.9 \ldots 0.95)\,S$$

Table 3

Nut								
Diameter of thread, d	10	12	16	20	24	30	36	42
Width across flats, S	17	19	24	30		46	55	65
Diameter of described circle, D	18,7	20,9	26,5	33,3		50,9	60,8	72,1
Height of Nut head, H	8	10	13	16		24	29	34
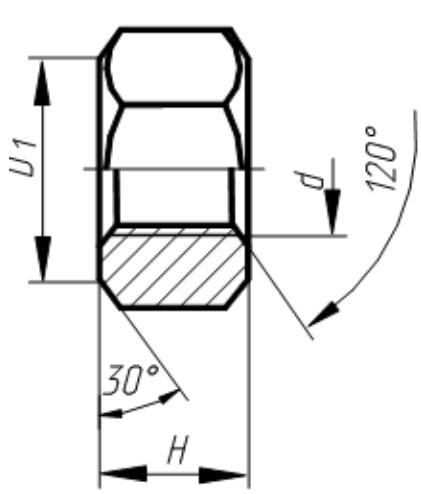
Variant 1   Variant 2
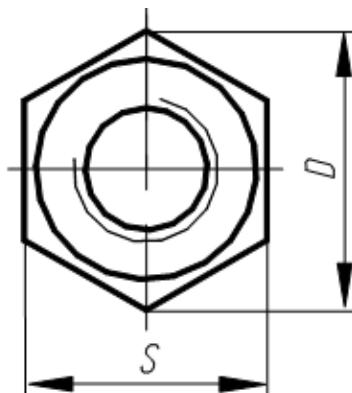
$$D_1 = (0.9 \ldots 0.95)\,S$$

Table 4

Washers								
Diameter of thread, d		10	12	16	20	24	30	36	42
Internal Diameter, d_1		10,5	13	17	21	25	31	37	43
External Diameter, d_2		21	24	30	37	44	56	66	78
Thickness, S		2	2,5	3	3	3,5	4	5	7
Chamfer	e	0,5 1,0	0,6 1,2	0,75-1,5	0,75-1,5	от 1 до 2	2	1,2 2,5	1,7 3,5
	x	1,0	1,2	1,5	1,5	1,5	1,5	1,5	2,1
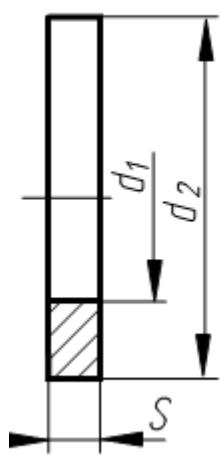
Variant 1   Variant 2
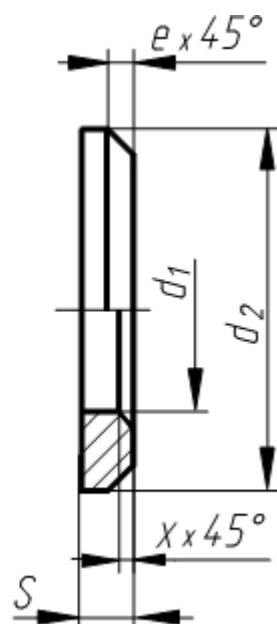
Graphic work № 6

Construct sketches of details, an assembly drawing, make the specification.

Variant 1
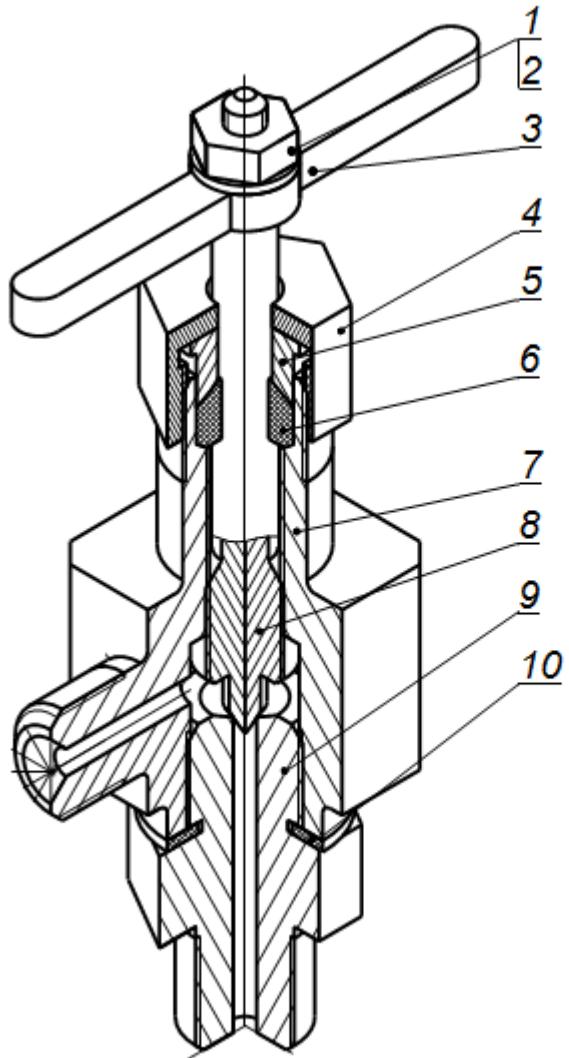
Angle valve

1 – Nut M8; 2 – Washers 8; 3 – Handle; 4 – Captive nut; 5 – Press bushing; 6 – Insert; 7 – Housing; 8 – Spindle; 9 – Union; 10 – Insert.
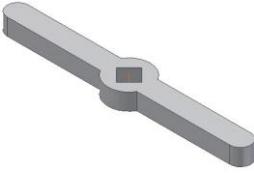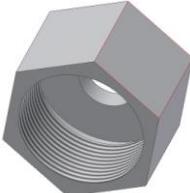
Handle	Steel (St.3)
Captive nut	Steel (St.5)
Press bushing	Steel (St.3)
Housing	Steel (St.3)
Spindle	Steel (St.3)
Union	Steel (St.3)
Nut M8	
Washers 8	
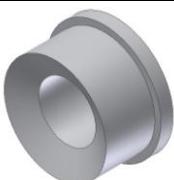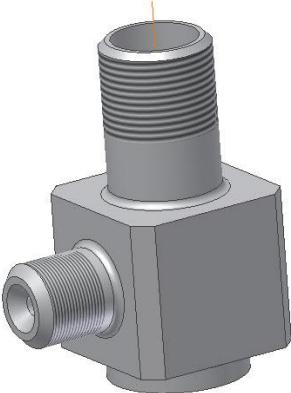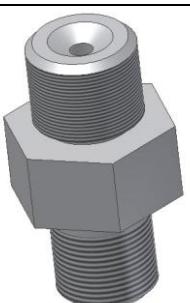
Variant 2
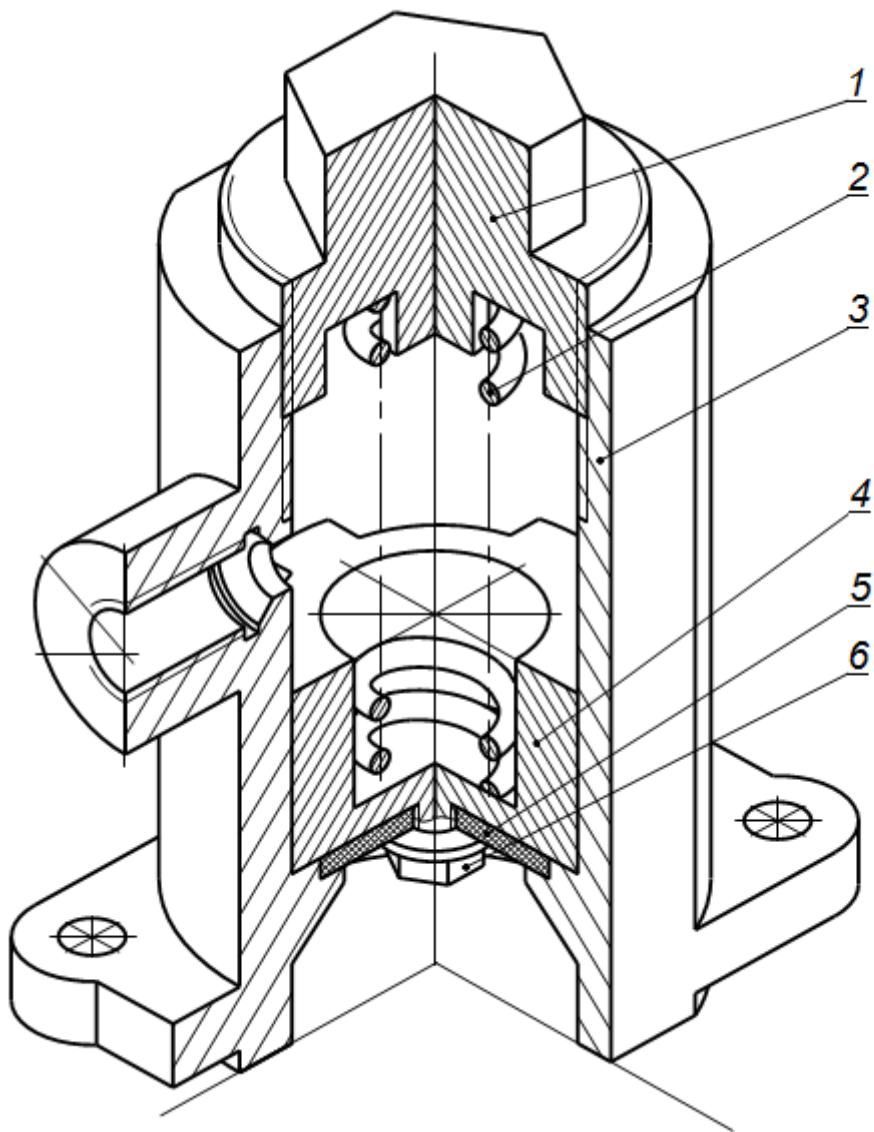
Angle valve

1 – Nut; 2 – Spring; 3 – Housing; 4 – Zolotnik; 5 – Insert; 6 – Washers; 7 – Nut M8.
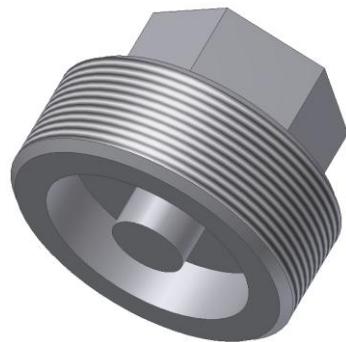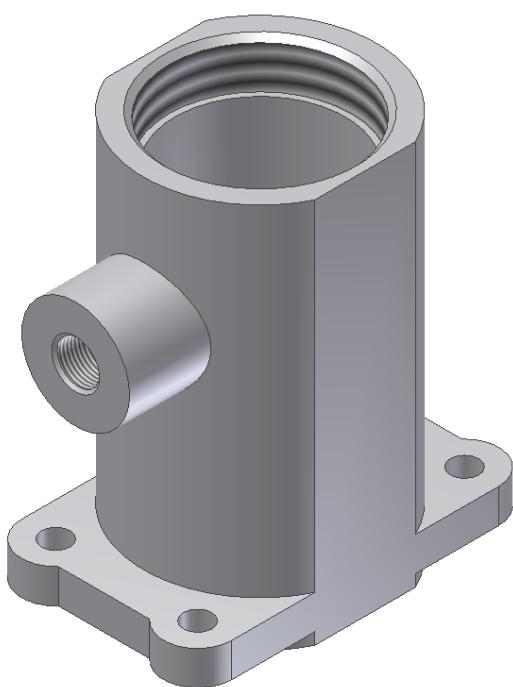
Nut	*Steel (St.5)*
Housing	*Steel (St.3)*
Zolotnik	*Steel (St.3)*
Nut M8	
Washers 8	
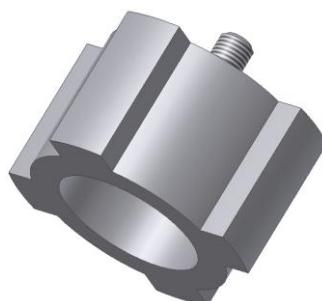
Variant 3
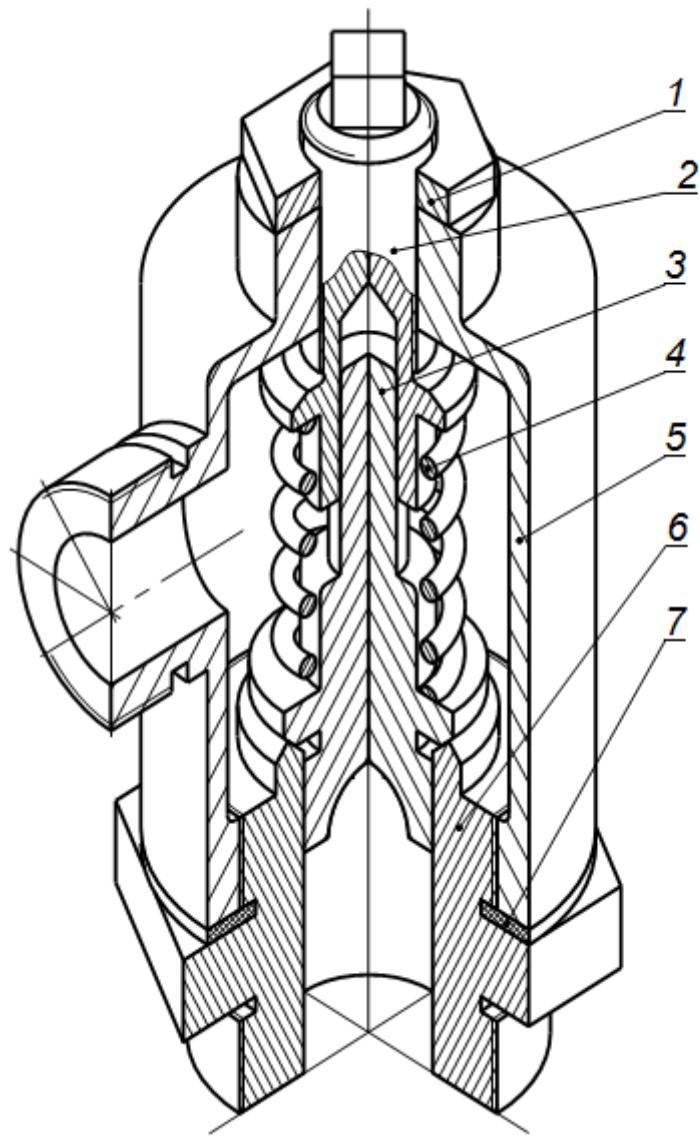
Angle valve

1 – Nut; 2 – Spindle; 3 – Zolotnik; 4 – Spring; 5 – Housing; 6– Union; 7 – Insert прокладка.

Nut	Steel (Steel 10)
Spindle	Steel (St.3)
Zolotnik	Steel (St.3)
Housing	Cast iron
Union	Steel (St.3)
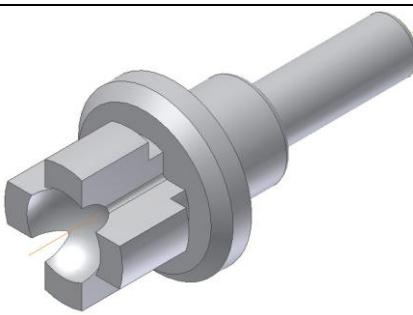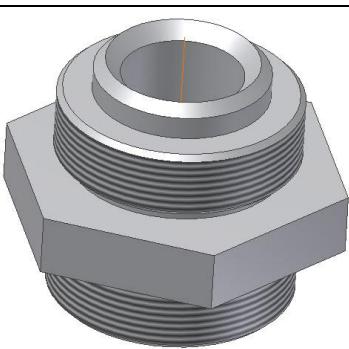
Variant 4
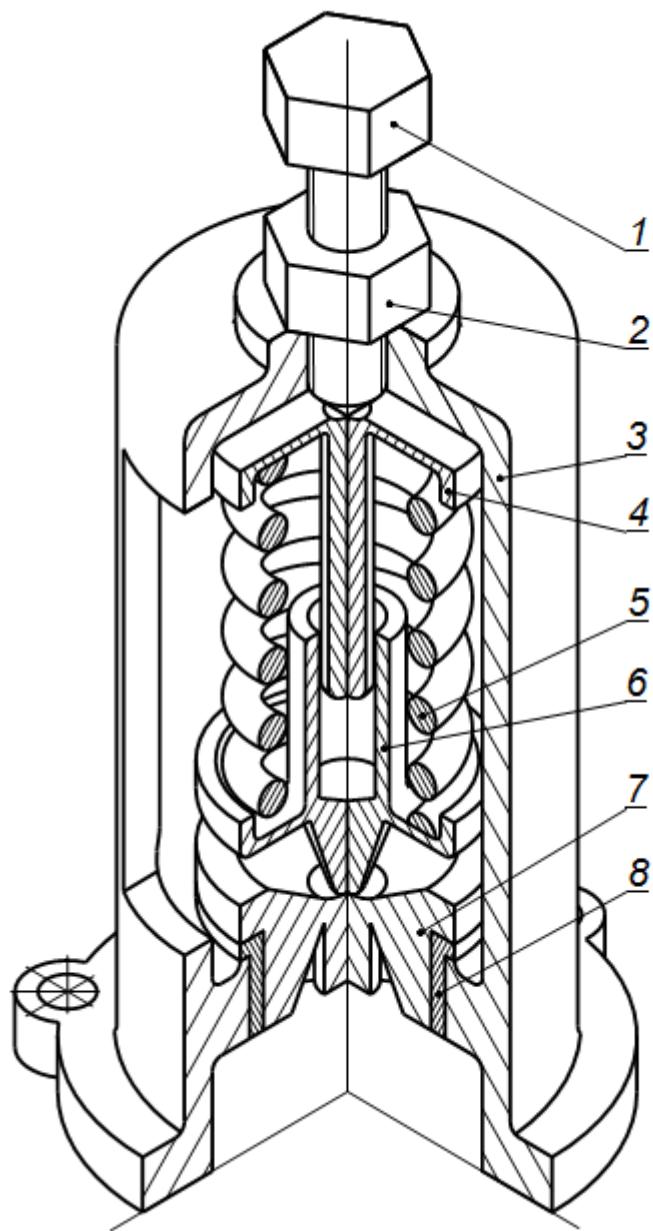
Angle valve

1 – Bolt; 2 – Nut M12; 3 – Housing; 4 – Emphasis; 5 – Spring; 6 – Saddle of Spring; 7 – Zolotnik; 8 – Press bushing.
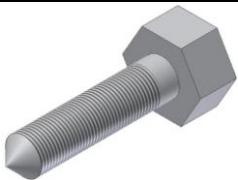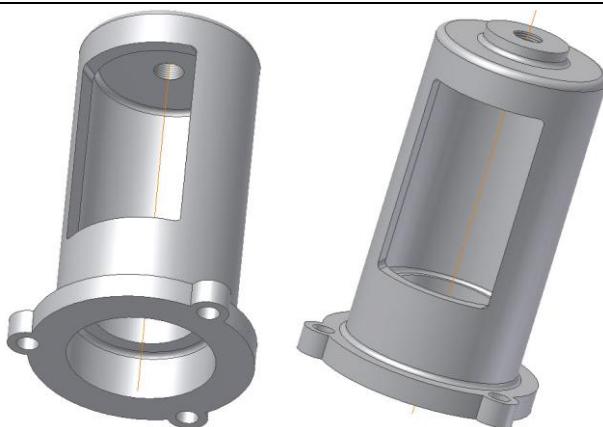
|	
Bolt	Steel (St.5)
Housing	Cast iron
Emphasis	Steel (St.3)
Saddle of Spring	Steel (St.3)
Zolotnik	Steel (St.3)
Press bushing	Steel (St.3)
Nut M12	
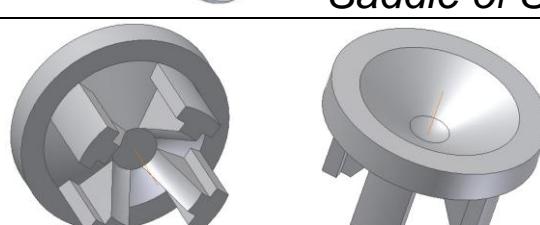
Variant 5
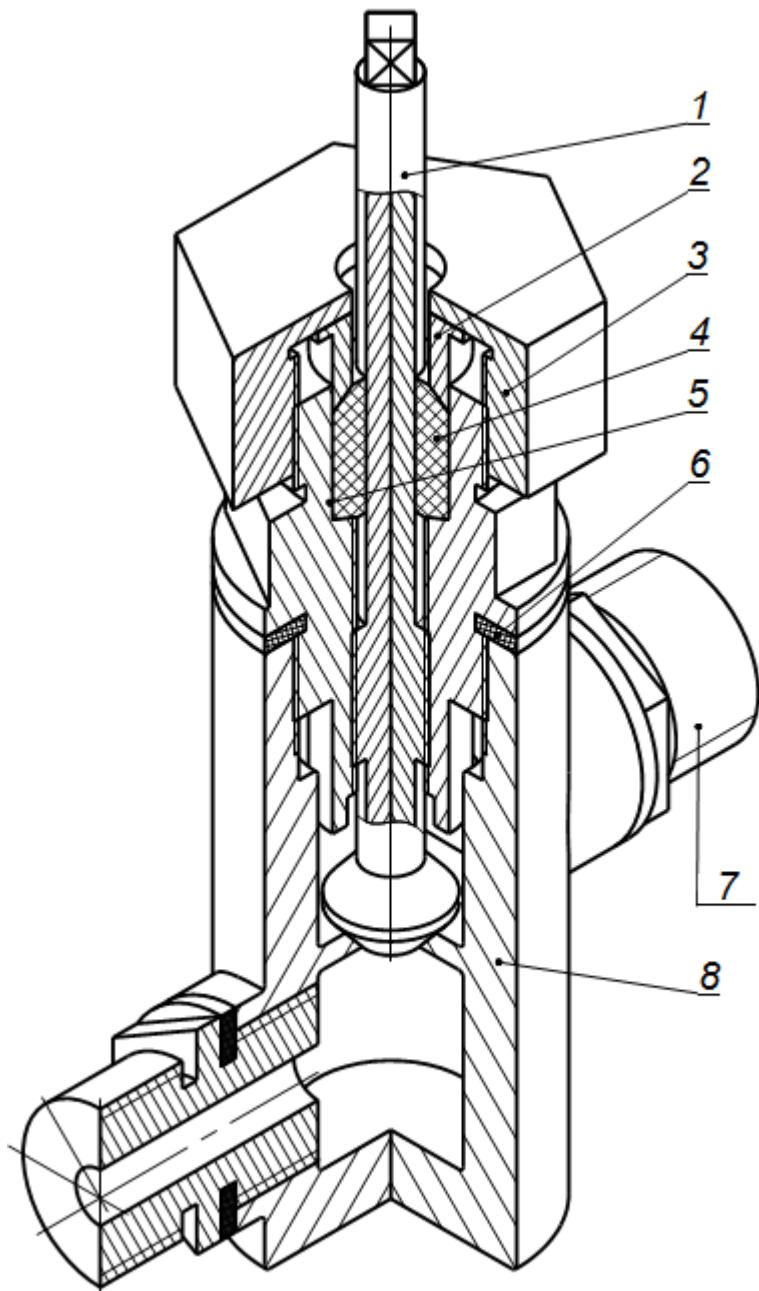
Angle valve

1 – Spindle; 2 – Press bushing; 3 – Nut; 4 – Insert; 5 – Union; 6 – Insert; 7 – Union; 8 – Housing.

|	
Spindle	Steel (St.3)
Press bushing	Steel (St.3)
Nut	Steel (St.3)
Union	Steel (St.3)
Union	Steel (St.3)
Housing	Steel (St.3)
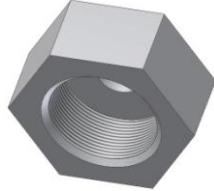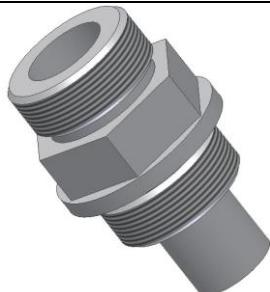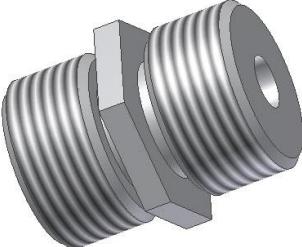
Graphic work № 7
Variant №1
On a general view, execute the drawing of the specified details.
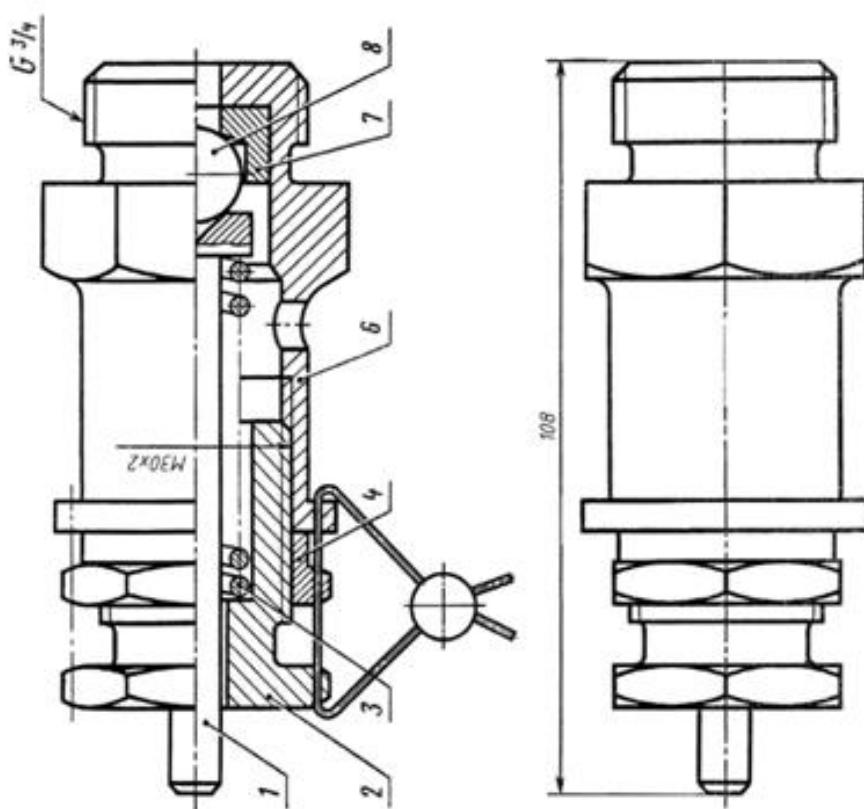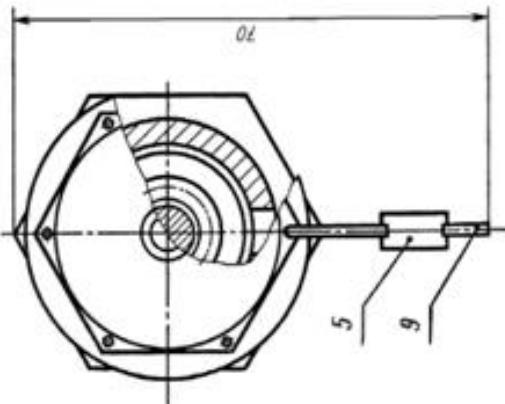
Variant №2

On a general view, execute the drawing of the specified details.
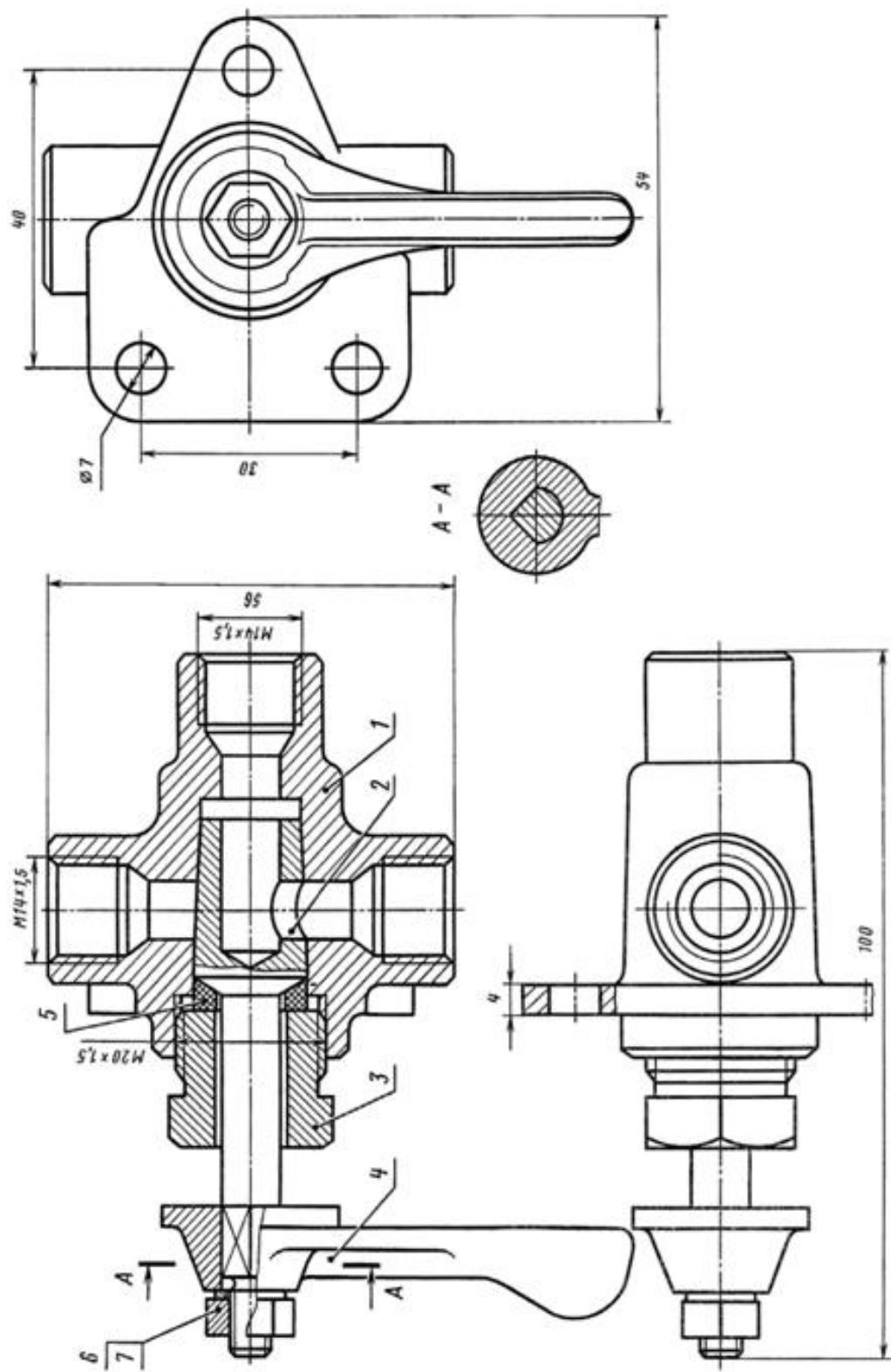
Variant №3

On a general view, execute the drawing of the specified details.
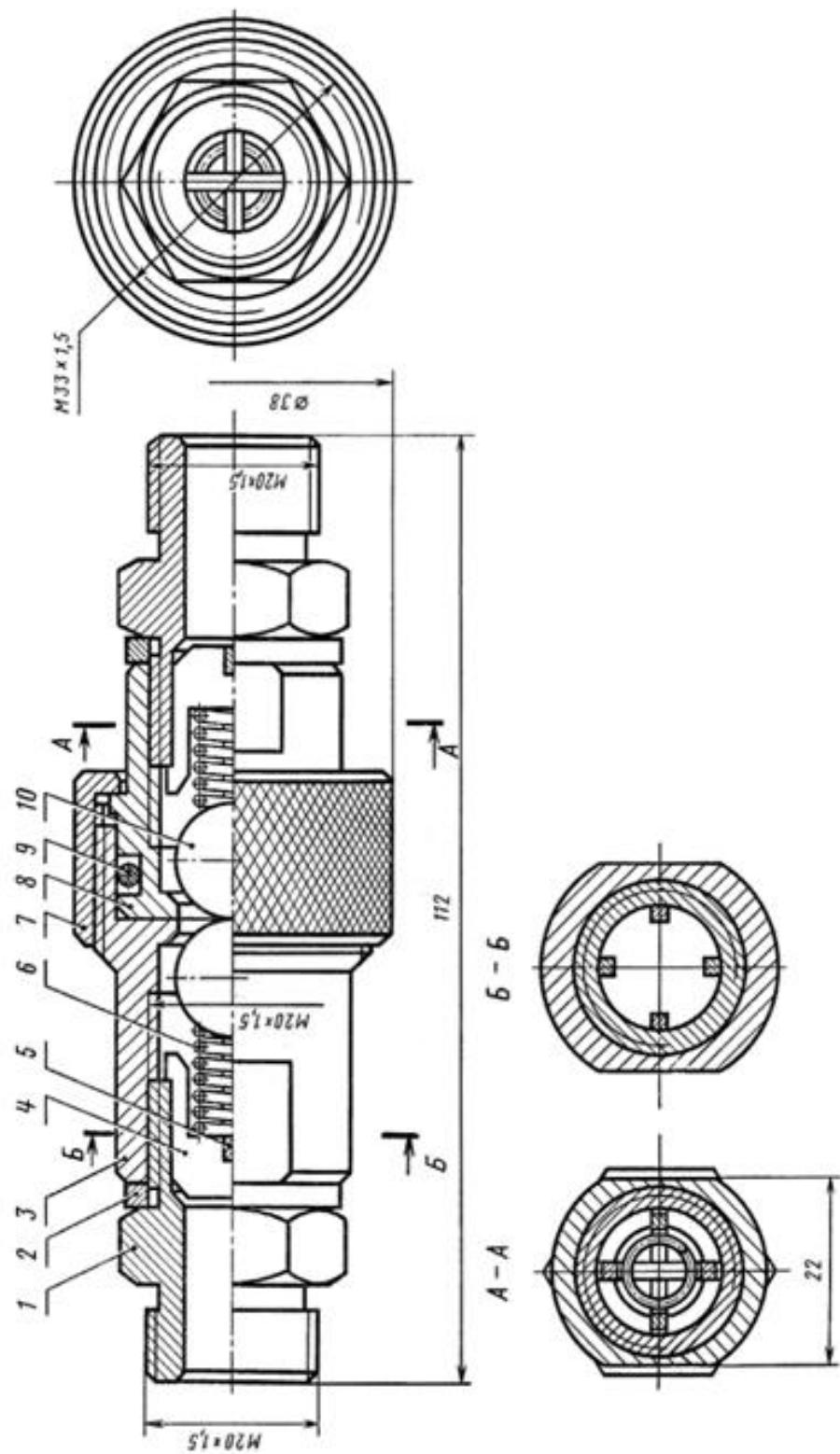
Variant №4

On a general view, execute the drawing of the specified details.
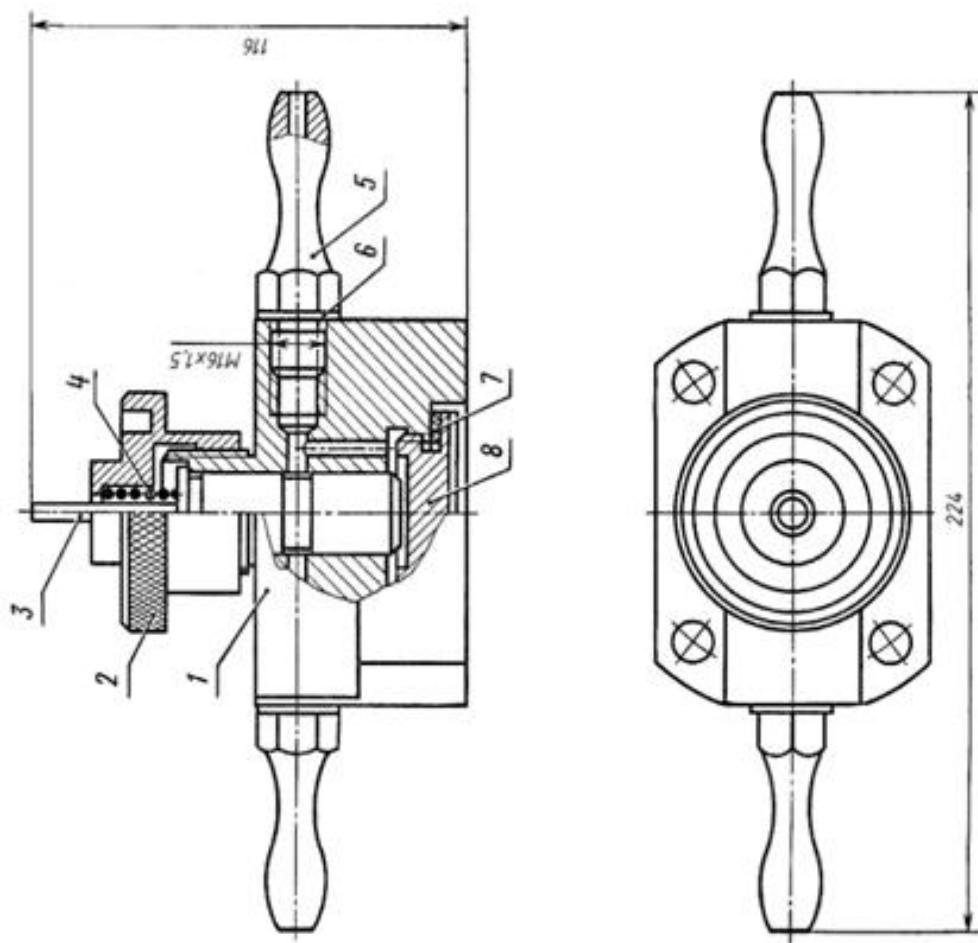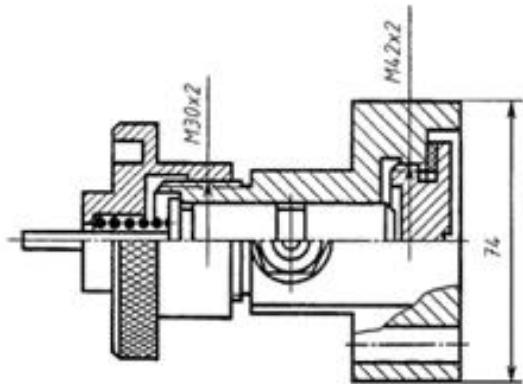
Variant №5
On a general view, execute the drawing of the specified details.