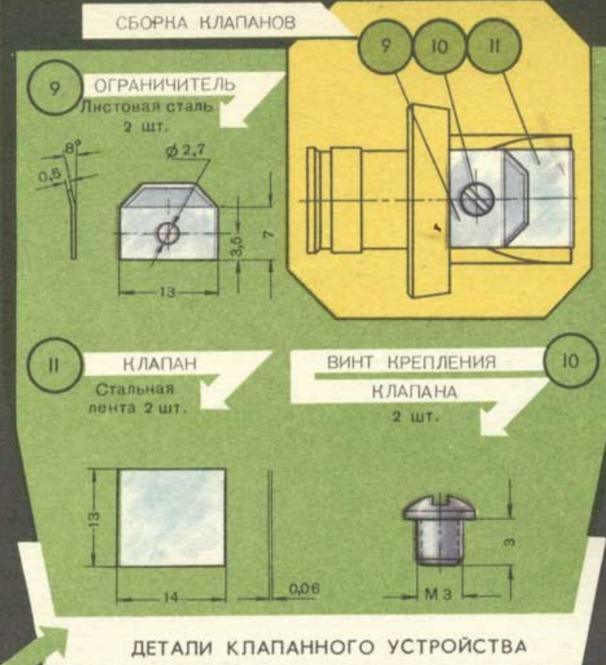
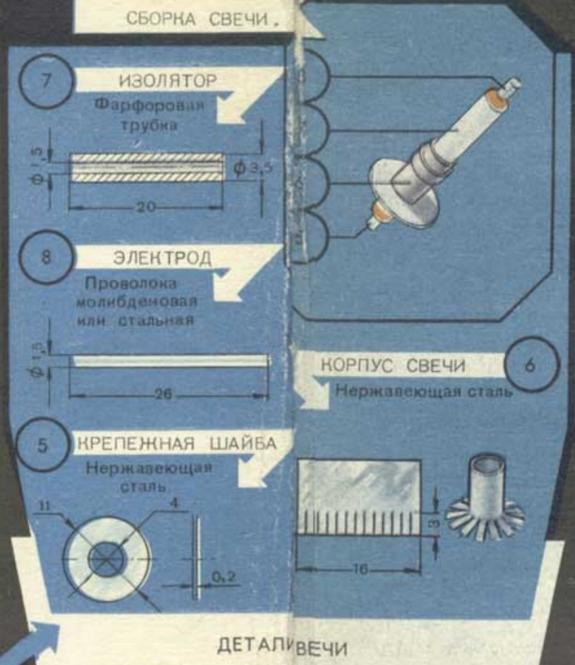


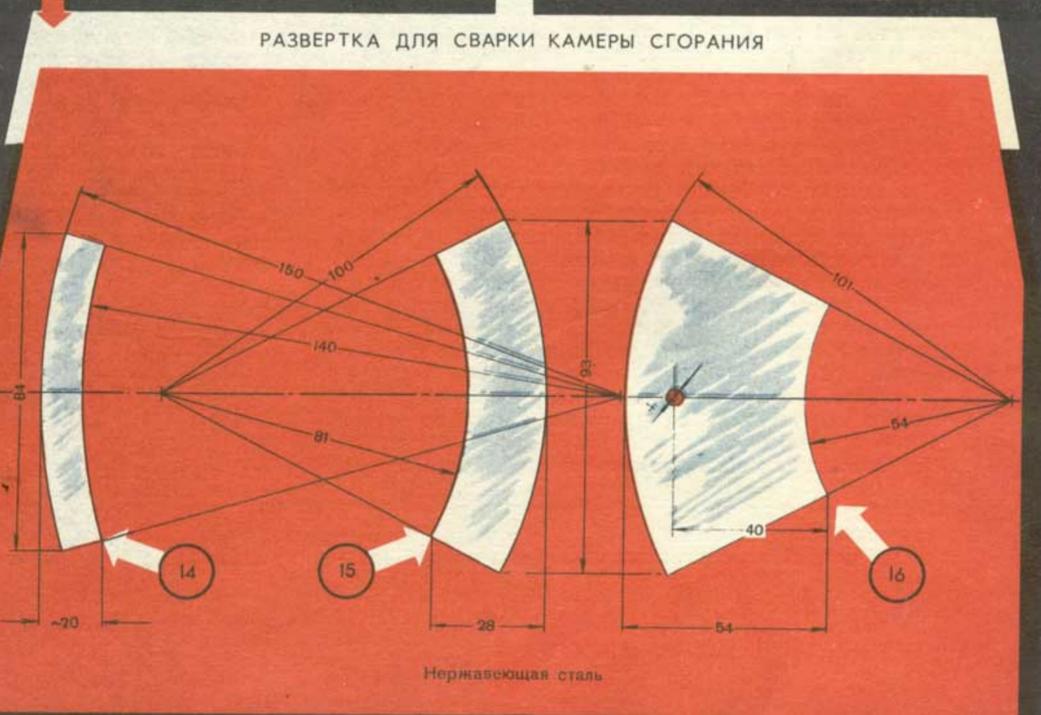
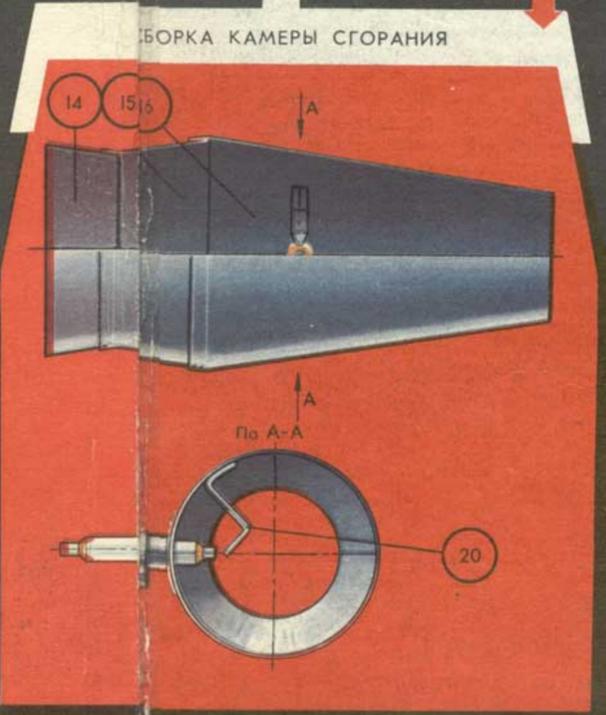
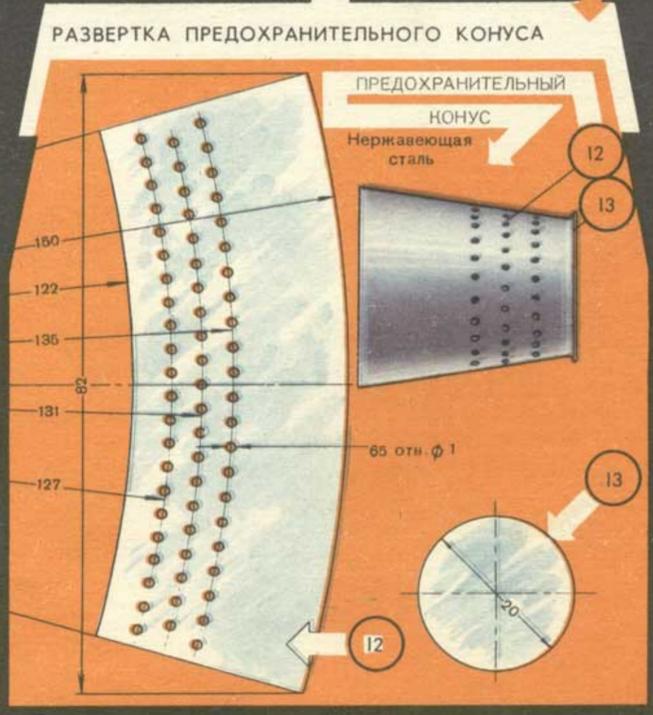
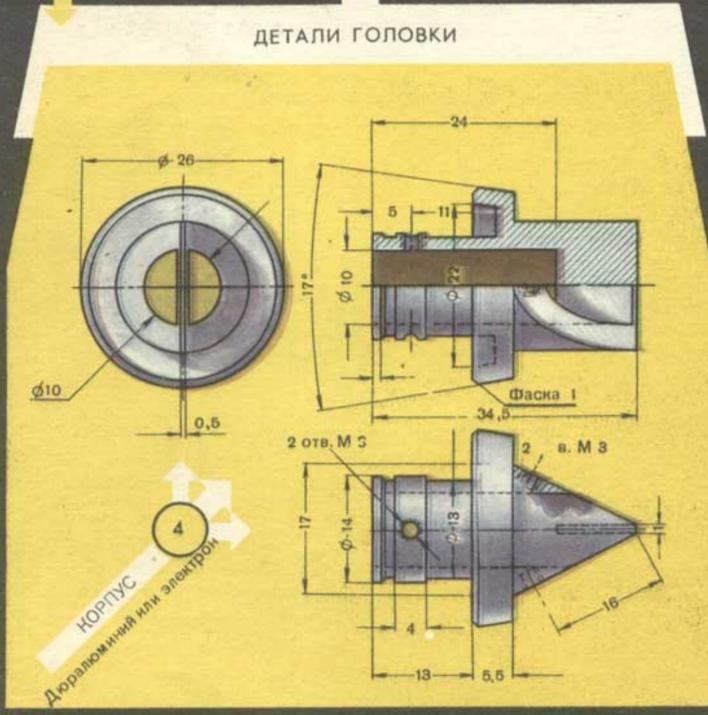
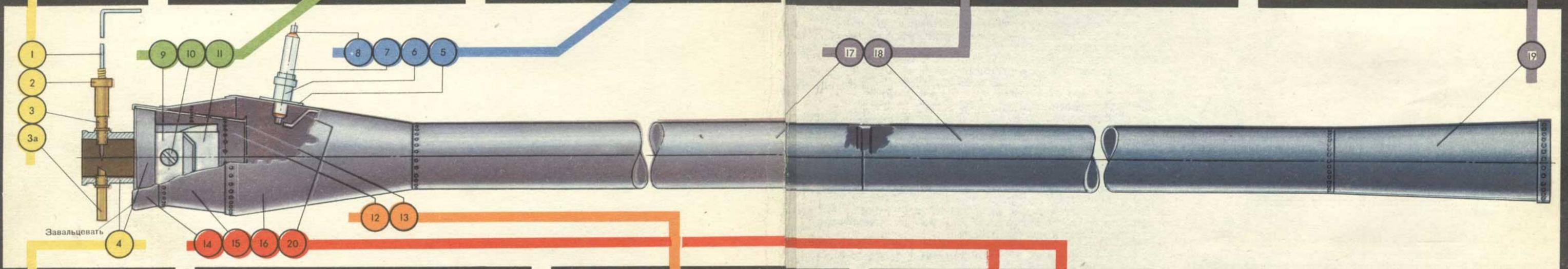
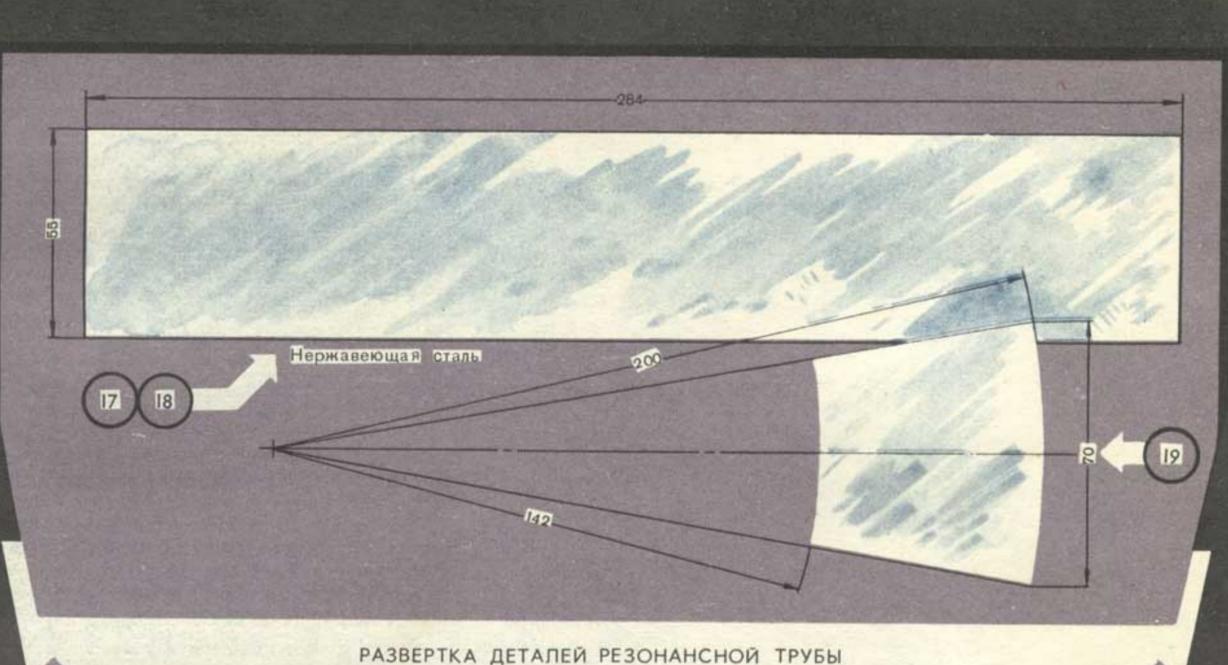
ДЕТАЛИ КАРБЮРАТОРА



ДЕТАЛИ КЛАПАННОГО УСТРОЙСТВА



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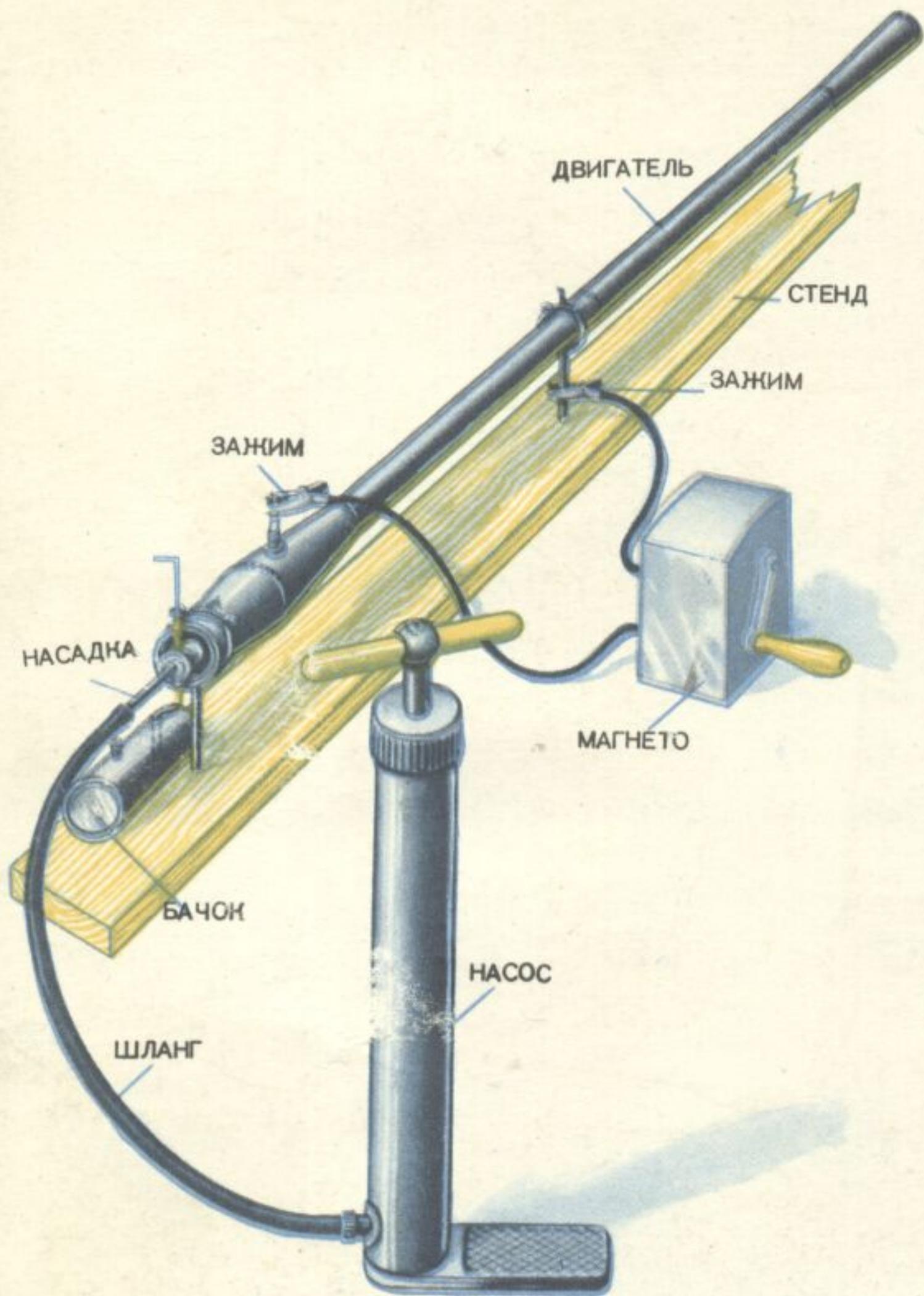
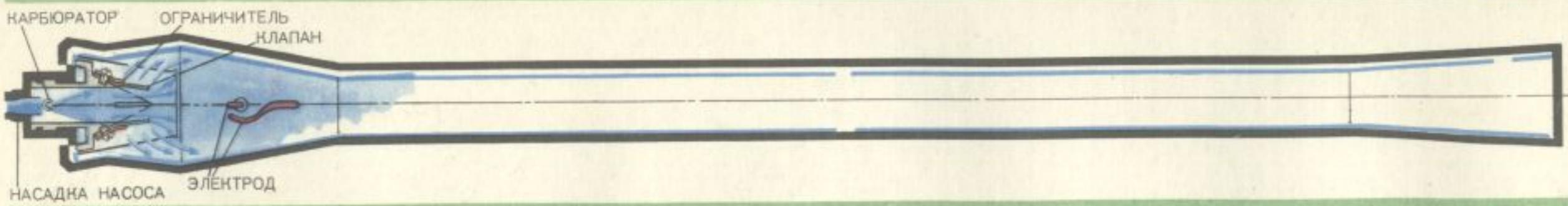
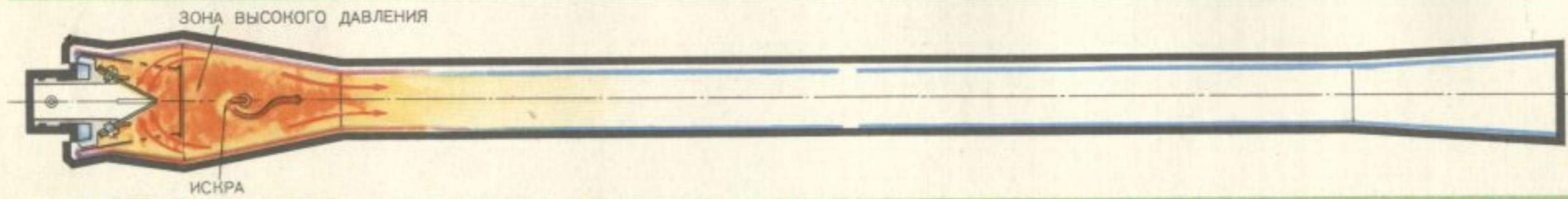


Рис. 2. Подготовленный к запуску двигатель А-7

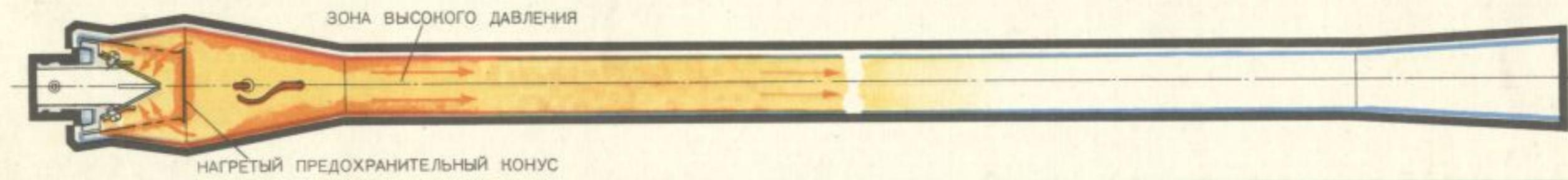
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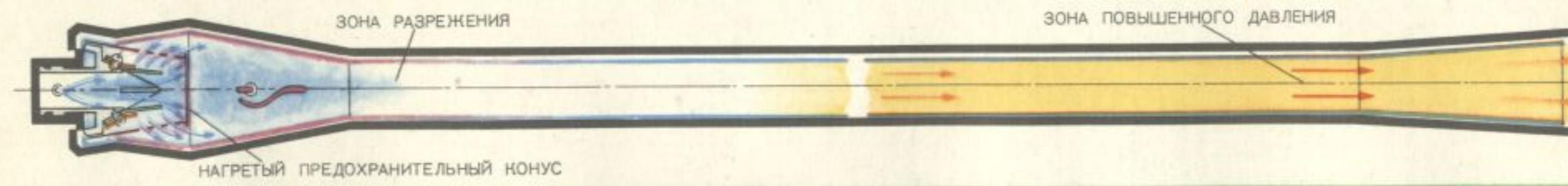
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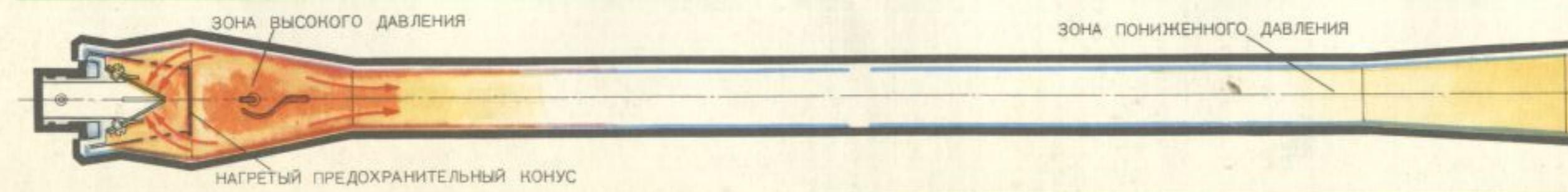
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## **Pulse Jet – Translated from Russian by John-tom (& Google)**

### **Pulsating air-jet**

Now, we introduce yet another engine - pulsating air-jet, for short - PuVRD. As the title says - a jet engine, ie, creating cravings by expiring reaction from the combustion of fuel; which the air-jet, is used as fuel oxidizer for oxygen air. And finally, this pulsating engine, because the combustion of fuel and the subsequent expiry of combustion products it is not continuous, but are cyclical in nature. Thrust PuVRD determined expiring products of combustion of fuel - their number and speed also varies cyclically during the work, with its average value much less than the maximum.

Pulsating nature of the work of the engine made it uneconomical use of large aircraft, compared with engines having a continuous process of combustion - pryamotochnymi air-jet (PVRD) and turbokompressornymi air-jet (TVRD).

But for flying models PVRD inapplicable because of the low velocities flight models, I TVRD are extremely complex design and cost for flying models are not justified. But PuVRD can be applied with success, and they are used as models for the cord, and svobodnoletayuschih. PuVRD develop the airplane big enough traction, low-weight, working at nedefitsitnom fuel, are safe to operate and easy to manufacture. Aeromodeller have developed many types PuVRD. Here we describe only one of them - the smallest in the world PuVRD - A-7. Weight this engine only 60 grams and created his thirst more than 200 city Izgotovit it can be when there lathes and apparatus for spot welding or roller.

The engine consists of two main parts: the combustion chamber with the resonance pipe and head of engine.

Fig. 1. Pulsating air-jet A-7:

1 - stop needle, 2 - nut, 3 - guided; Over - zhikler, 4 - corpus, 5 - Attachment disc, 6 - corpus candles, 7 - Detention; 8 - electrode; 9 - protector, 10 - mounting screw valve; 11 -- Valve, 12 - obechayka safety cones; 23 - bottom safety cones, 14, 15 to 16 - cone of the chamber; 17, 1 B - cylindrical portion of the exhaust pipe: 29 - cone, 20 - electrode

Combustion chamber with the resonance pipe made of stainless steel sheet (for example, stamps EI-654) thick 0, 15 mm through spot or roller Electric. You can use stainless steel with thickness 0, 1 or 0 2 - 0, 3 mm, but the engine of a thin steel faster progorit combustion chamber and engine of the more thick steel will be heavier. When the thickness of material 0, 2 mm total weight of the engine is equal to 75 g, while the thickness of 0, 3 mm-100 g. In an extreme case, you can boil the combustion chamber and the resonance of the tube neluzhenoy tin thick 0, 3 mm.

Resonance tube consists of two parts. By the combustion chamber of the front half of the resonance welded pipes, the rear half into a densely front and can be turned on it. This makes it possible to regulate the model, changing the direction of propulsion engine, which coincides with the axis in the direction of the rear half of the resonance tubes (and not with the axis of the combustion chamber, as is sometimes mistakenly think).

Templates parts of the combustion chamber markup, vyrezhi and flex them in accordance with the drawings. Bending billets need for special bars. Vytochi bars of red copper, as they produced and welding parts. Curved harvesting roller or spot welded Electric so that the seams were leakproof. Achieve full tightness in the seam spot Electric could, if put in a 2-3 series at a distance of 1-1, 5 mm. In the combustion chamber is set improvised elektrosvecha. Construction of a candle is clear from the drawing (see fig. 1). When building candles fitted to lead surike central electrode in Porcelain Detention Facility, a detention facility - in the shell candles. The body candles hermetically welded to

the combustion chamber. Joints in the shell with candles combustion chamber cut surikom lead. The second electrode flex them from steel wire 1 mm in diameter, to flatten out one end and welded his spot Electric to the combustion chamber.

The head of engine consists of a body and set it on the carburetor, valves and pressure jacket. The body is made of dyuralyumiya D-1T or electron. Segmental holes in the rear of the hull make sawing nadfilem pre-perforated holes. All sharp edges are rounded.

Details carburetor vytochi brass. Carburetor needle made of wire EOD 1 mm in diameter. By the needle nut soldered in a manner which vvertyvani needles can be completely cut a hole in zhiklere. For more reliable connections needles + nuts before refillable brazed needle tightly wrapped copper wire.

Valves vyrezhi steel tape marks U7A, U8A or U9A and carefully zachisti their province - cracks and sharp edges should not be. Constraints vyrezhi of mild steel 0,5-1 mm thick and flex them in accordance with the drawings, their purpose - to limit the angle of deviation valves, to avoid breakage. Pressure hood welded stainless steel EI-654 mm thick 0,1-0,2. Tentatively to make housing on the circle only one series of holes - in the future, setting the engine number of openings will be clarified and probably increased.

Heads start to gather with the installation of valves. Priverni to the shell caps and valves podsun under them. Align them so that segment holes in the hull completely overlap, the screws and tighten them in this position. Be sure to install the valves, naden the shell casing pressure, slurred tentatively glue BF-2 seats compounds, and slightly, at two points, his raskerni while keep in mind that in the operation of the engine casing, this would have to withdraw to replace the valves.

Insert head tightly in a combustion chamber, also blurry place compounds glue BF-2. The edges of the combustion chamber razvaltsuy the shell head.

Carburettor gather at least, by ensuring that the needle was precisely against zhiklera holes. Tightness manufactured engine checks naduvaya its resonance through the pipe smoke.

Adjusting and launch. To start the engine are needed (Fig. 2): the source of power - such as magnetite; motor pump; benzobachok.

How does the engine run? At the end of the hose pump naden metal tube with an internal diameter of 2-3 mm. Tube to become flat so that its output hole was oval shape about 1 mm in width.

Bachok settle as well. that the level of fuel is not changed dramatically when the engine. Best of all, if the level of fuel will be lower by 15-20 axis engine mm. Attach the ends of magnetite to the engine: one - to the central electrode candles, the other - to the body of the engine. Rotating handle magnetite, check availability listening sparks. Set needle carburetor to its original position adjustment, which wrap needle to complete overlap of the holes in zhiklere and then vyverni its turnover by 2-3.

Set pump tubes in the axis of the engine before zhiklerom at a distance of approximately 3-5 mm and start the air pump, while turning a pen magnetite. Vyvertyvaya vvertyvaya or needle, ext first individual cotton, and then sustained a prolonged operation of the engine. It may be that to achieve sustainable operation of the engine could not be immediately. The reason for this, in addition to improper assembly of the engine and not tightness, may be inadequate or excessive holes in the pressure housing.

If the engine gives the outbreak only when there is a boost from the pump, the reason for this - the insufficient number of holes in the pressure housing. In this case, removing the head from the engine combustion chamber, the pressure to make another housing several holes. Collect engine and repeat the launch. In the same way producers adjust the engine, increasing the number of openings in the pressure housing until the engine does not work steadily and post-retirement forced the air, and without work magnetite. Do not make a lot of holes at once - with more than you need, the number of holes in the pressure housing engine will work only with the ignition (of the magnetite), in which case the pressure will have to replace the casing.

Adjust the engine starts easily and steadily works. However, to avoid premature progoraniya combustion chamber should not be prolonged operation of the engine in place without his air of

airflow.

The engine runs on gasoline, consuming its 0.3 - 0.45 g per second; his thirst with more than 200 city Source power supply disconnected from the engine in 1-2 seconds. sustainable operation of the engine.

The principle of work. Consider the operation of the engine since its launch (Fig. 3).

With the help pump air pressure applied to the entry engine, opens the valves, dispersing fuel and recorded it in the combustion chamber (A). Iskra of candles sprayed flammable fuel, resulting in pressure in the combustion chamber increases and valves are closed (b). Educated at combustion of fuel gases are beginning to expand, but can only move towards the end of the engine (B).

Coming on the resonance tube gases acquire greater speed. In the long pipe resonance, due to inertia in the fast moving exhaust gases in the combustion chamber formed allowable and valves are opened again, but already by atmospheric air pressure (pump no longer needed). Rushed into the combustion chamber air dispersing fuel and recorded it in the combustion chamber (G). Couples fuel soprikosnuvshis with burning in the previous cycle protective casing and the combustion chamber walls, ignite, the pressure in the combustion chamber increases, the valves are closed (D), and the cycle repeats itself for the engine.

The length of the resonance system of pipes and valves of the engine well harmonized among themselves. When changing the length of pipe resonance achieve sustainable operation of the engine will fail. Engine resonance with a short pipe would have a greater frequency of pulsations (and therefore greater cravings). But allowable in the combustion chamber it is insufficient for the full opening of valves and combustion chambers fill sprayed fuel. The engine with a long pipe has little resonance frequency fluctuations and small cravings.

A-7 engine was used on many models of airplanes, helicopters and "flying boat" (two A-7). Light weight and dimensions make it possible to use this engine is very broadly - as models of free flight, and on the cord.

Fig. 3. The engine Scheme A-7:

A - excess air to the engine pump; B - ignition of the fuel-air mixture of candles; In - the expansion of combustion of fuel in the chamber and the exhaust pipe; G - education dilution in the combustion chamber and the delivery of the fuel; D - ignition of the fuel-air mixture pressure from cone