



“FIRST HOURS”

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M. A. Gershenzon

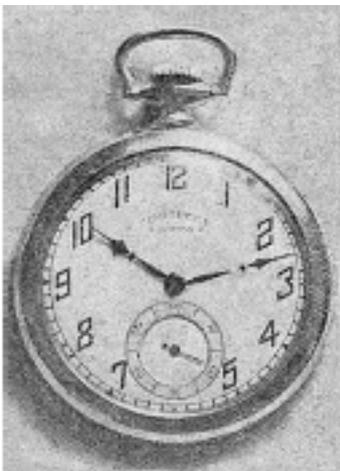
“We will have to go by tram number 51 or 16” said my photographer. We rode the tram for half an hour. Then we got off and stopped in front of a building on which was written in large letters: The First State Watch Factory.

“Well, you came, said the comrade.” He entered the office and brought out two pink passes. “Come on,” he laughed. “There is no need to blink.”



The door opened in front of us. At that very moment I turned into Gulliver. The steamer sails on the ocean. Where are we? - the captain should know. He determines the position of the sun and looks at his watch. In this year, on this day, at this hour, the sun can be seen in this position only at a certain latitude and longitude. The captain now knows where the steamer is.

You need to calculate the speed with which the conveyor moves. It is necessary to determine the arrangement of jobs. One operation will take $1\frac{1}{2}$ minutes, another $3\frac{1}{2}$ and the third 6. The timekeeper does not take his eyes off the clock. If the time required for each operation is poorly calculated, the conveyor will work intermittently. At the right moment, the conveyor will substitute the mold for a fiery stream of cast iron. A small delay and the cast iron has cooled down. Now it has nothing to pour into the mold; still get a marriage.



At exactly seven o'clock the collective farm leaves for a trial sowing. At 6 hours 45 minutes you have to be assembled. The foremen check their watches in the evening. Astronomers predict exactly, minute by minute, the beginning of a solar eclipse, which will be in hundreds of years.

The weather bureau predicts what the weather will be like tomorrow. To do this, you need to conduct observations of atmospheric pressure in different regions. The pressure at a certain hour is marked on a geographical map. The tower clock strikes. A voice is heard on the radio: "Listen to the chime of the clock from the Spasskaya Tower."

The hands of an electric clock travel slowly in a circle over streets and squares. All over the world in millions of pockets, on straps, on chains, on bracelets watches are ticking. We walked through spacious, bright workshops. There were no mighty beds fixed in concrete. Lilliputian machines were placed on long tables. Unaccustomed, it was difficult to recognize them as old acquaintances - milling and turning machines.



Workshop - 1st State Watch Factory.

Comrade Rakov, the head of the bureau of inventions, showed us the plant. "It is a very complicated business - watchmaking. There are about three hundred different parts in a pocket watch. To make them, more than two and a half thousand operations are required. And some details are so fine that you have to work with very strong eye loops. Take this detail, the balance axis. It is no more than a cumin seed and it takes up to twenty-five operations."

He ran his finger over a small bowl that was on the machine and showed us at the tip of his finger a part with intricate cuts, teeth, constrictions. It stuck to the finger along with a drop of oil; the oil in the bowl was poured so that the caraway seeds carved out of metal would not fall and scatter. The drop of oil seemed huge, and the finger on which the part was lying was, of course, Gulliver's; and of course Gulliver was the worker at the semiautomatic device.

"Now let's go to the running shop," said our guide. "The heart of the watch is made here, the indexing mechanism, which regulates the gradual, uniform deployment of the mainspring."

But then I paused; my head was spinning from these minute details. They appeared in my eyes, like specks of soot when the kerosene accumulates heavily. I was completely confused among the Lilliputians machines, placed on long tables, among the long glass workshops, among the inhabitants of these spacious workshops the Gulliver's.

"No, Comrade Rakov," I finally pleaded. "I'm tired, I won't understand anything now. We'd better come to your club in the evening: after all, today you have a plant conference. We'll hear what's going on at your factory. Then it will be easier for us to get acquainted with the work of the shops."

December had ended - the last month of the third, decisive year. The workers and engineers of the First State Watch Factory gathered in their club for a conference; to sum up the work done and to celebrate the fourth and final year of the five-year plan. The huge dial, carved out of plywood, rose behind the stage like a painted sun. The orchestra members, squeezed into a corner above the choirs and blew their flutes, sang on violins and on cellos. More and more watchmakers gathered. They were not at all like the old, gloomy watchmakers who sit alone in the corners from morning till night poking around at the old, bad, naughty watches. Cheerful people gathered in the club, most of all there were Komsomol members. Elderly workers brought their children with them: they also wanted to celebrate the New Year. The presidium is already on the stage. The man in a coat, with curly hair, is the director of the plant, an old Bolshevik, Vladimirsky. There was the chairman of the factory committee Comrade Sokov. That one, broad-shouldered, high-cheeked, is the secretary of the party collective Comrade Teplyakov.

The Komsomol secretary pours water into a glass. At the table, the best workers from the machine shop, the assembly shop, the gear train shop...

"Comrades" said the chairman, "guests from the Second Watch Factory came to see us. Let's give them the floor first."

"We fulfilled our annual plan ahead of schedule, on December 23rd". A worker from the Second Plant reported. "Our plant has instructed me to send you a challenge a socialist competition for next year." That's when the orchestra started playing and everyone clapped their hands and so began a cheerful and studious meeting about the 1932. Director Vladimirsky made a report on the work of the plant. "You all know the short history of our First Sentinel. Before the revolution we had no watch production. Tsarist Russia imported watches from abroad. We bought two old factories in America; Dueber-Hampden and Ansonia. Our factory was once the old Dueber-Hampden plant with old worn-out equipment. But the capitalists did not want to sell us the best. We have brought here machines and sets of unassembled watches and unfinished parts. We have invited teachers and foreign specialists. It is not easy to start work without trained personnel, without the technological design of the plant, without the necessary measuring instruments. But we still have a yard stick, with which we measured the distance between the machines when planning, without waiting for the drawings!

In the shock quarter of 1930, on the "day of the shock worker" on October 1, the plant was launched. The first year was a year of study for us. We have not fulfilled our industrial financial plan, we have made only forty-two thousand pieces of hours. The plant did not get out of the breakthrough. The machines were loose. There was no repair shop. There was a shortage of skilled workers. Production rates have not yet been established. There were not enough cutters, there were not enough details. This is how we face the new year?

We worked through our bottlenecks one by one. We now have a wonderful repair shop. The machines have been repaired. Our factory assistant gives us a militant, trained youth. There are production rates - three thousand rates for three thousand operations. They are tested by socialist competition and are technically sound. Udarnik work was widely developed at our plant, six instructions from Comrade Stalin helped us to reduce waste and increase labor productivity. Comrades! The machine shop, the shop that from month to month slowed down the implementation of the industrial financial plan of the plant, fulfilled its December plan by 135 percent. These numbers, comrades, should be the music of our plant!"

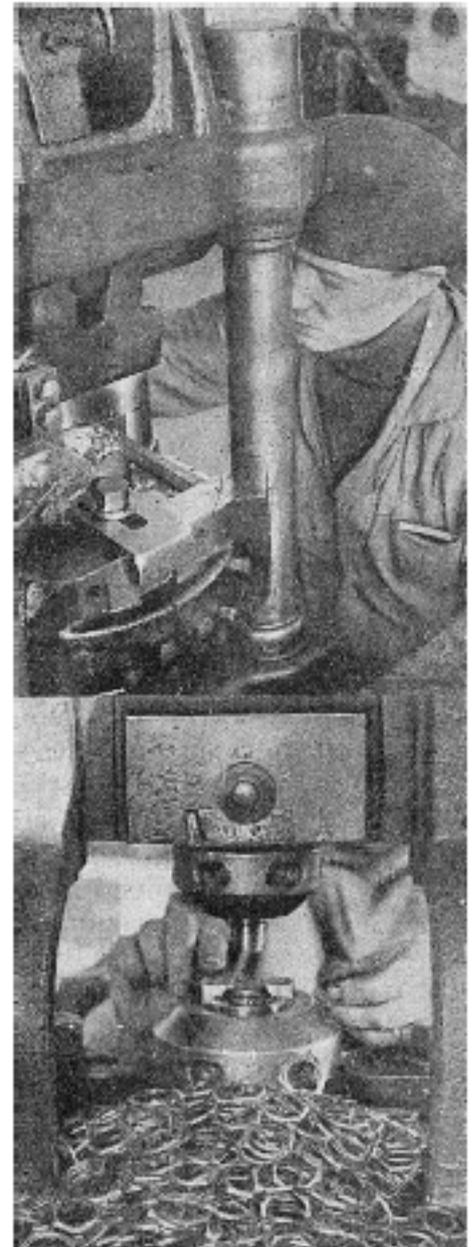
After the director, the chairman of the factory committee spoke about the plan for the new, 1932. We received an order from the Trust to produce sixty thousand pieces of watches in 1932. This plan has been worked out in the shops. The workers of the factory put forward a counter plan, seventy thousand pieces of good quality watches. They will fulfil this plan, because this figure was not taken from the ceiling, this figure came from the shops, from every machine tool and from every brigade. The secretary of the party collective read out the obligations that the plant had undertaken by the 17th All-Union Party Conference.

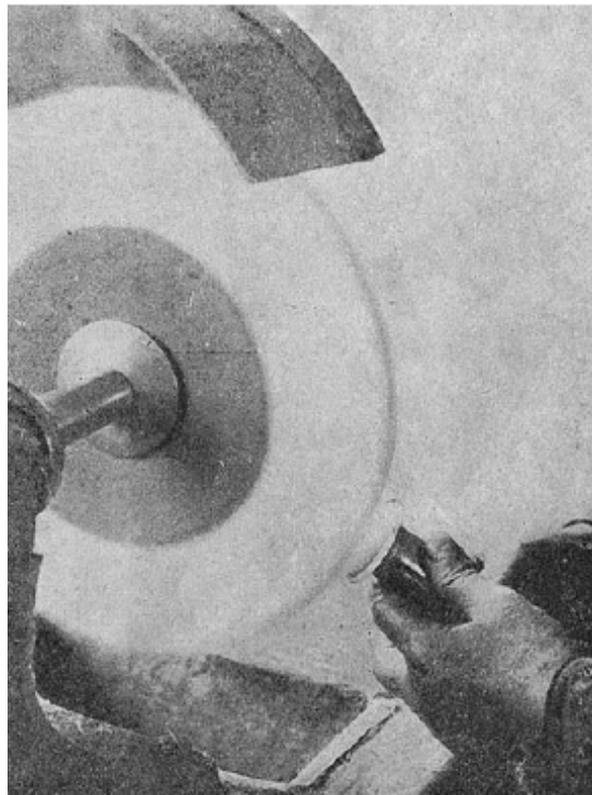
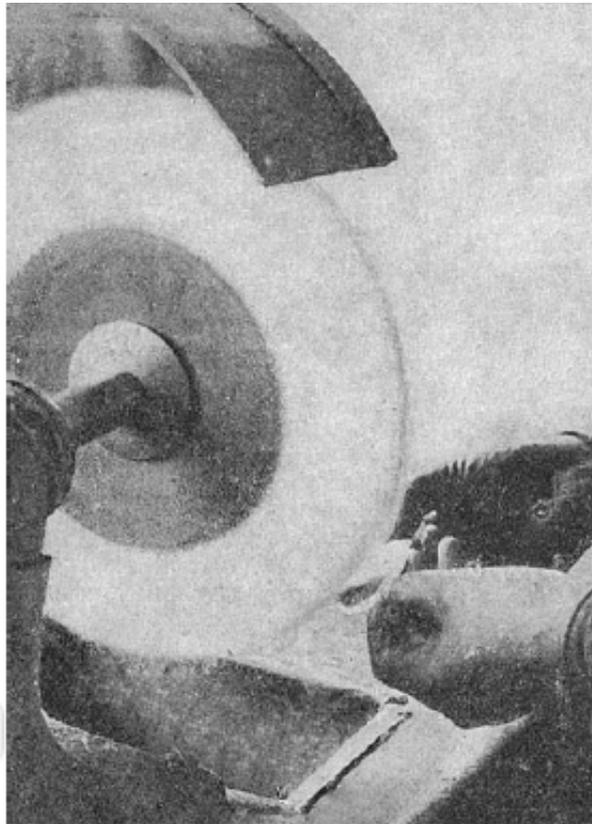
Then the workshops reported. On the stage, next to the presidium table, is the foreman of the best brigade - the gear train shop. He had just been standing to the side, lame and stooped, his thick eyebrows furrowed in concern. He just looked like those loners who, from morning till night, bend over the old, naughty hours in all corners. Now you don't recognize him. His shoulders straightened, his eyes sparkled. He is not just a watchmaker, he is the foreman of the 'Best Brigade of the Red Banner' workshop of the First Socialist Watch Factory. On behalf of the gear train shop, he passes the red banner to the machine shop, the winner of the competition: the gear train shop for December fulfilled the plan by 109.4 percent, the mechanical one - by 135.8 percent. "We promise to fight hard and regain this banner again," says the foreman and the orchestra amicably and cheerfully picks up his words.



The assembly shop speaks for the quality of the products. This guy who jumps on the audience like a young rooster is called Vasilevetsky. He gets excited and covers all the shops from the shoulder. We have not yet learned how to work in a Bolshevik way. We've got a bunch of screwed up parts. We confuse a lot of operations. The assembly shop is your mirror. Assembly is one of the quiet workshops. Come to us. We have hammers knocking, we adjust part to part, we shoe your mistakes. Forging a watch means ruining it. We release watches exhausted. They go through a shooting gallery or four brigades, and each worker must crush them, torture them. And why? Because you, in the pavement, in the mechanical, in the installation, miss the marriage. We must throw out the slogan next year - to reduce fitting and forging to zero. They picked up a set of parts, assembled the watch, and the clock started-up.

I looked at my watch. It was ten minutes past twelve. The New Year has already begun, the fourth and final year of the five-year plan. This is just my workshop, smiled Rakov. Before, before Breeze, I worked here, in the corps. There are simple processes, mainly punching and swaging. Here the rims are stamped, and here are the covers. This is the body neck crimp. The neck undergoes a series of operations until it takes the desired shape. The machine shop also prepares platinum and bridges for the bridge. Here, in watchmaking, platinum is not the name of a metal, platinum is a platform on which all the gears and rollers of the watch are then installed. And the bridges: anchor bridge, balance bridge, drum bridge and chassis, they will grab the parts from above. All our material is from the Kolchuginsky plant. The quality of the material is, one might say, good. Here, in the corpus, there are also my inventions. I've invented a lot of things here. For example, the bow is folded over, for which a chain is attached to the watch. I suggested this method of making the bows.





Polishing the watch case cover

The grey calico wheel rotates rapidly. Some wheels are covered with emery paper, others with polishing paste. The worker presses the watch case to the soft wheel, the case shines like polished satin.

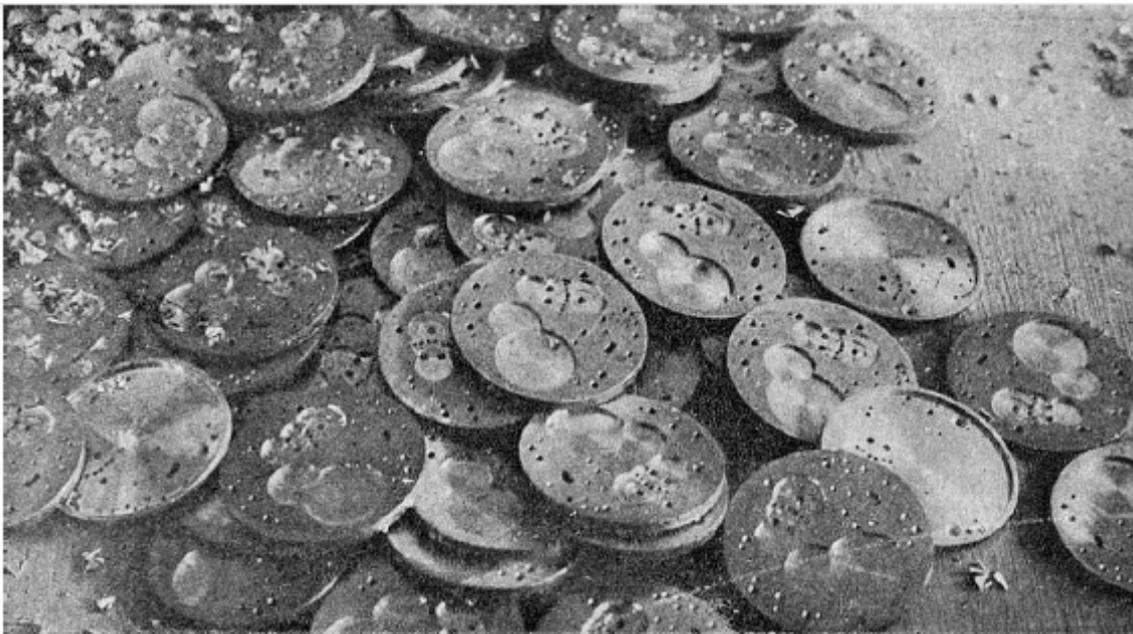
“This is my holding tool” says Comrade Rakov. “Before, when grinding and polishing, the watch case was pressed against the wheel directly with your fingers. Now you take this tool by the handle, its head moves apart and firmly grabs the case. Of course, you can do more with a tool than with your hands; it goes faster and the work is easier”.



The bridge shop continues the work of the machine shop. Here, in the plates and in the bridges, they mill the nests for the wheels, bore holes into which the axles will enter. The drilling machine quickly drills holes for screws in the plates. Small, twisted into a cone, shavings of brass are underfoot. Here, at her station, Komsomol member Dzanaeva works. She invented a simplified chamfer cutter for bridges. Chamfering is the removal of the sharp edge of a hole after drilling. Previously, this was done with two blades tucked into one cartridge, such blades were difficult to install, and Dzanaeva replaced them with one simple curly blade. "Here, in the bridge shop, we recently discovered theft" says Comrade Rakov, embarrassed. "There will be a trial soon".

I was at the trial. The entire collective of workers of the factory tried the enemy who made his way to the production department. The trial took place in the same club where the gear train shop recently handed over the banner of honor to the machine shop. A public prosecutor from the district party committee interrogated the enemy. It was a cunning and sneaky enemy. Hiding behind a Komsomol ticket, he crept into the plant. He ruined the Komsomol work in the shop. He found "companions" for himself and opened a small private factory at his home: thieves stole sets of parts, assembled them at home and sold them on the market. Hundreds of proletarians of the First Sentinel now understood why the plan was poorly fulfilled on the ground. They threw the villains out of the factory and from the Komsomol, pronounced a stern sentence on them, and vowed with even greater vigilance to protect their socialist production from the class enemy.

"In the machine shop, everything is done by Gulliver's," said my photographer. In order for such small details to be visible in the picture, I will have to photograph very close-ups.



Bridge shop products.

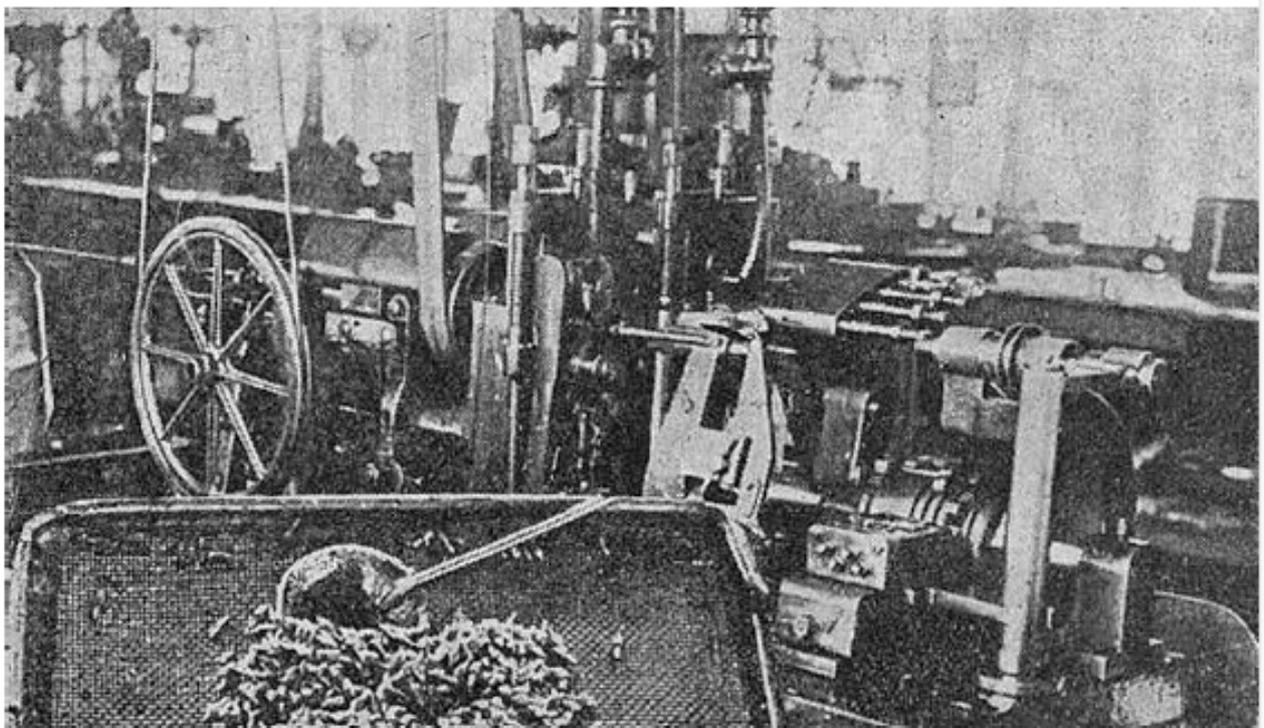
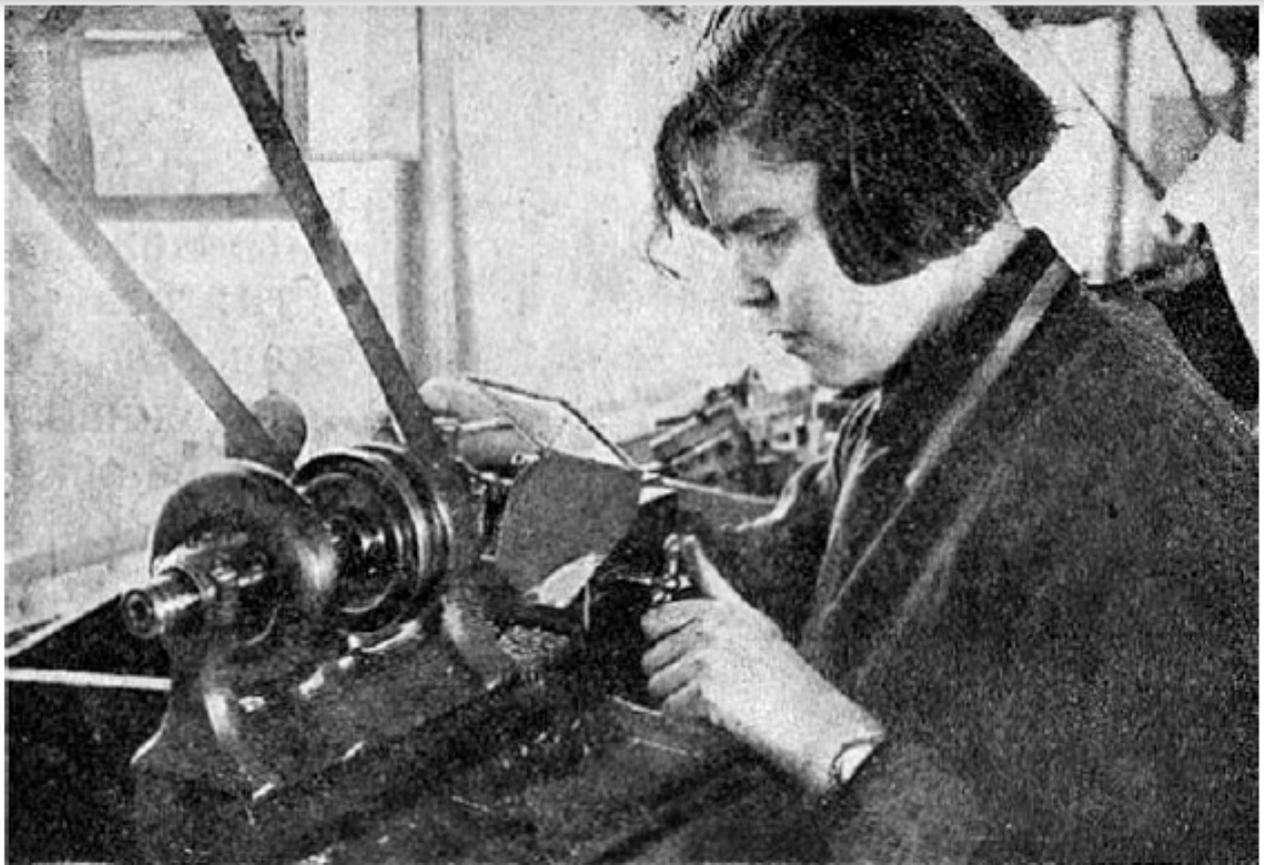
On long machines there were rows of turning and milling machines and semi-automatic machines. Semi-automatic is a smart machine. There are semi-automatic devices that perform three or four operations on a part in succession.



“These semi-automatic devices are our problem” says Comrade Rakov. “It’s an outdated production method. Much still depends on the experience and skill of the worker. Every detail has to be passed through the hands of several controllers. A lot of work and a lot of marriage. Whether it’s a machine gun! I stuffed the material into it, and it’s done: it will turn it around, it will unfold it, it will measure it and cut it off. Here’s how the machine works: almost unattended. Precisely, at regular intervals, a trickle of oil carried the finished, fresh piece onto a wire sieve. If not this year, then in the future we will reconstruct our plant, replace, where possible, semi-automatic machines. This is required by precision.

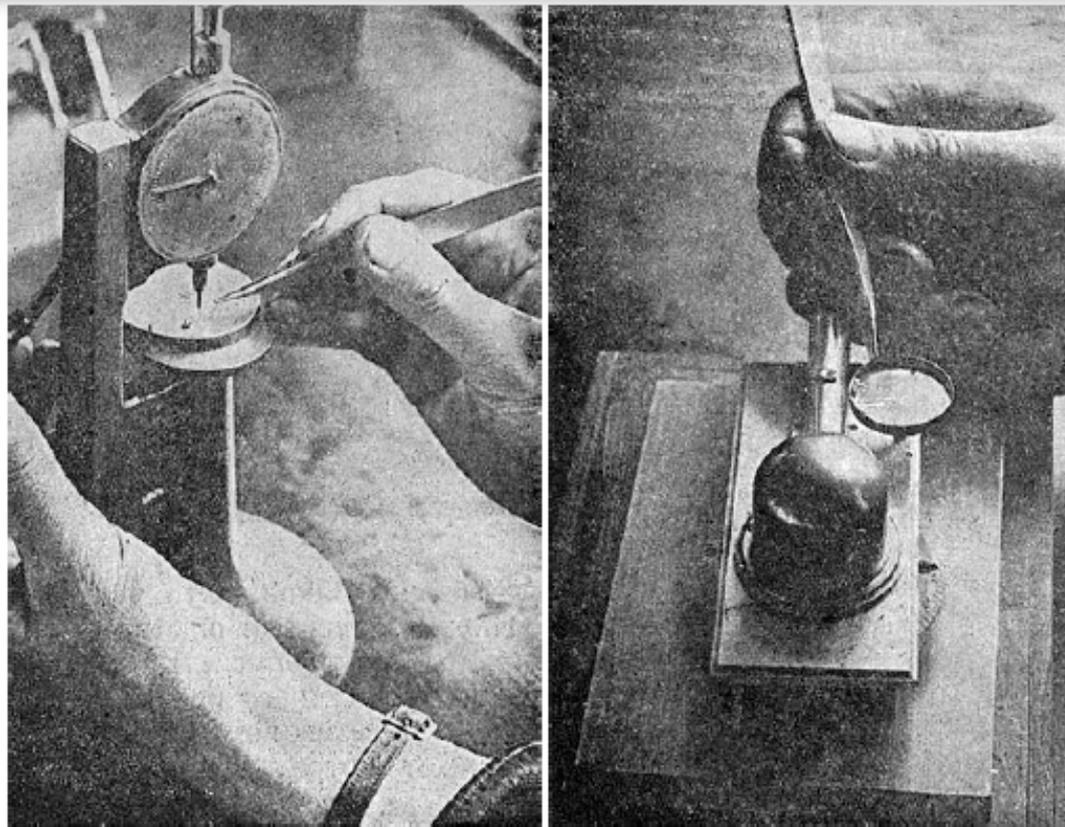


Semi-automatic operations.



Work of the Machine Shop

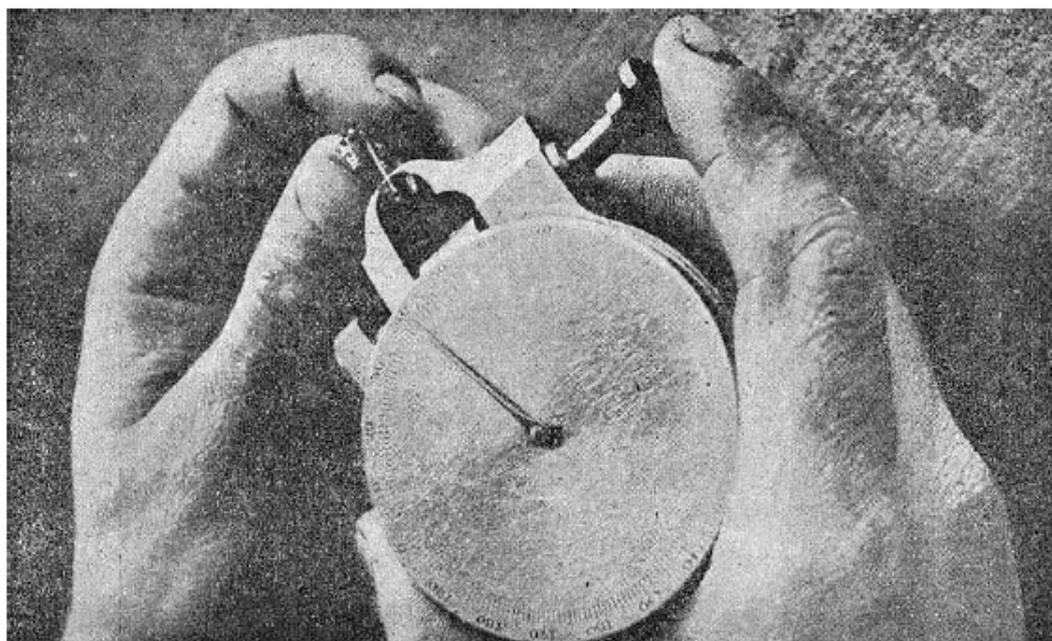
Accuracy! Every machine requires precision: without precision there can be no quality. A watch is a very small and complex machine. The tiniest mistake in one detail and the mechanism will die. It won't work.

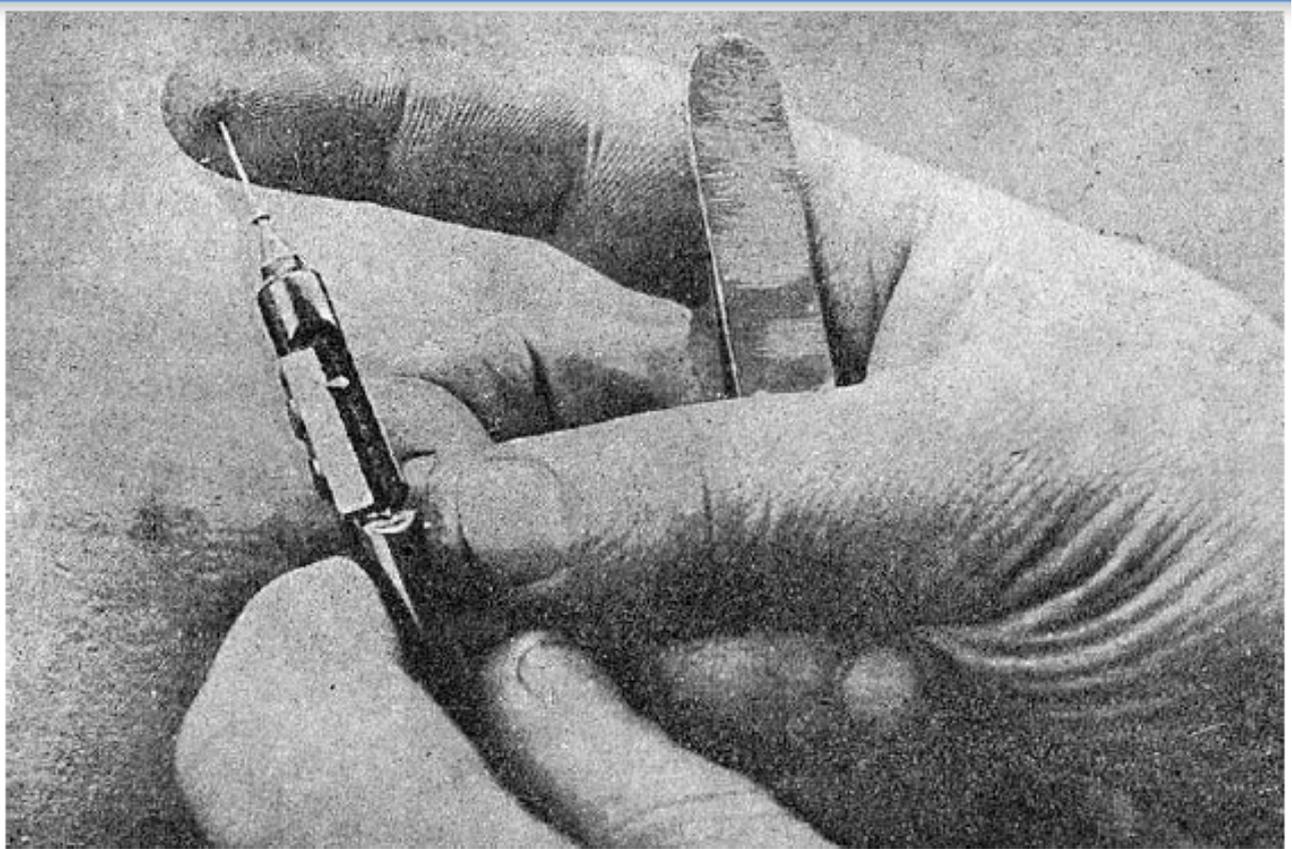


From the machine shop to the assembly shop where dozens of inspectors check to see if every detail has been made accurately. Each workshop has a table for finished products: this is a watchdog quality. All brigades have hourly precisions. They check every operation. The detail is examined with a magnifying glass. It is checked on precision measuring instruments.

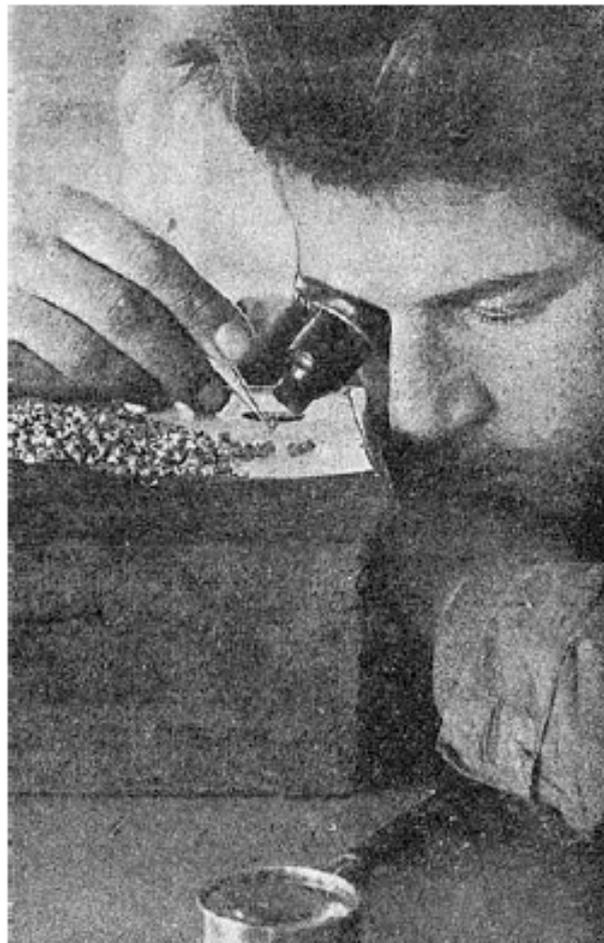
This platinum plate has an error of a hundredth of a millimetre - the vertical indicator shouts. "And this is the correct detail," says the round box.

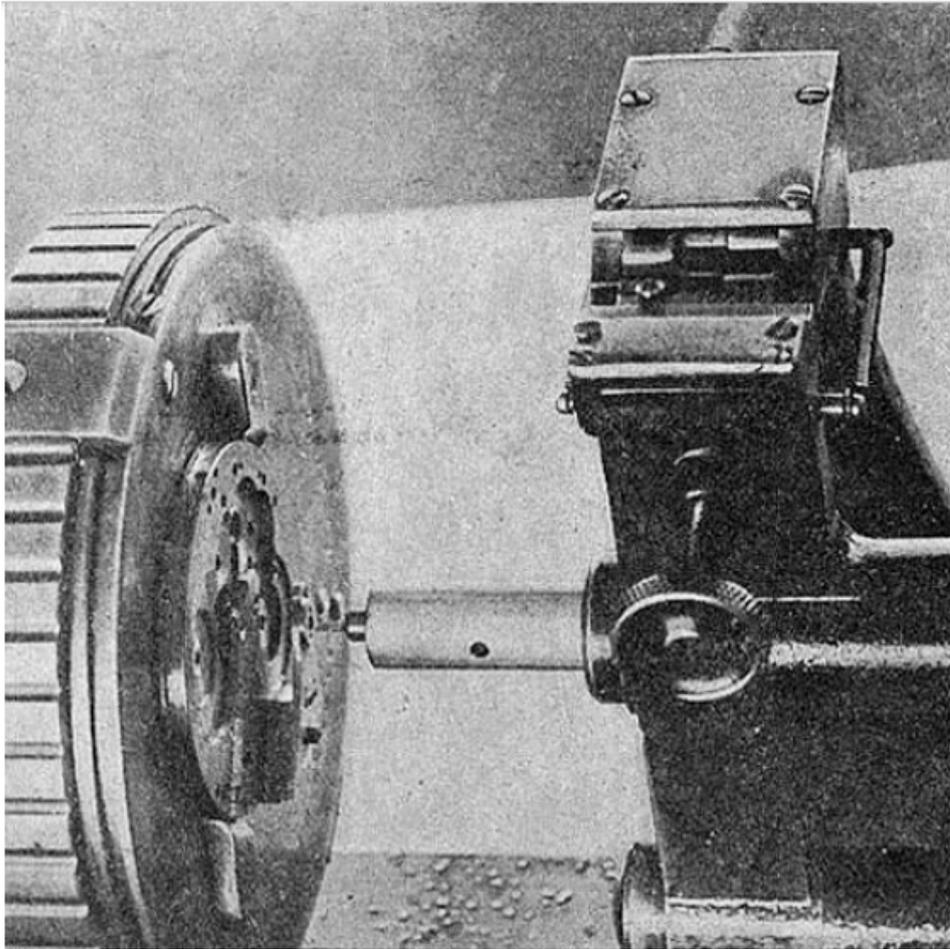
"This screw is one tenth of a milligram heavier than it needs to be," the exact scales show. The worker checks the width of the hole with a needle. This is a thin cone. The scale shows how far the part has traveled along the needle.



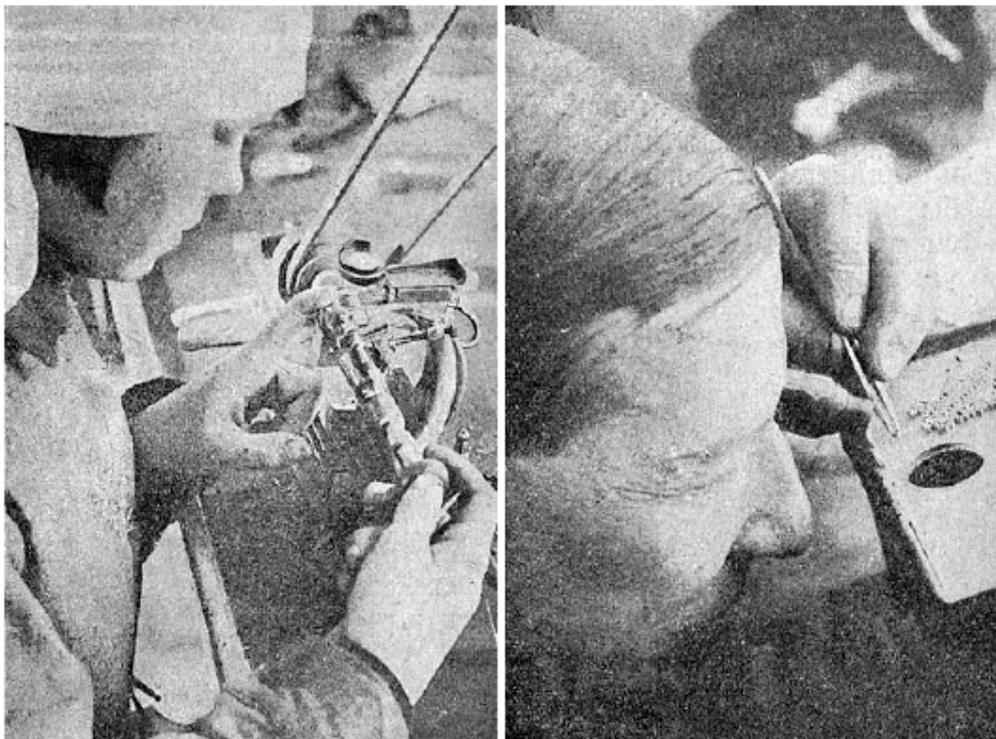


The Gulliver's in these pictures reject the screwed up parts. They throw the bad parts aside; they throw the good ones into the drawer through a round hole. But after such machines, the inspectors have nothing to do.





These are copy machines. A colored pebble in a brass setting is sandwiched between the cheeks of the machine. And the cutter carves a socket in the platinum exactly to the size of this part. The detail will be larger - the nest will be larger.



Every good watch has bearings. Only they are not like those ball bearings that are manufactured at our Moscow 1st Ball Bearing plant. In watches, the bearings are stones: thin slices of ruby or sapphire. The axles of the wheels rest against them. They reduce friction in the watch; parts are worn less, the whole mechanism lasts longer and more accurately.

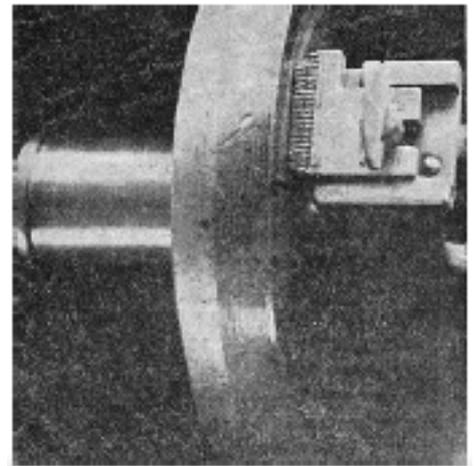
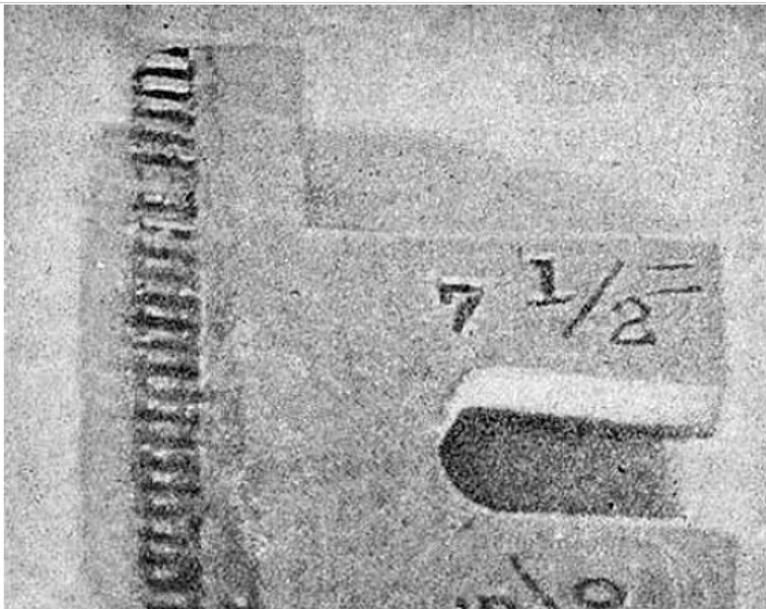
The pink stone is rolled into a brass setting. Then the inspector will examine each frame in a strong magnifying glass and drop good" chatons "into the box. Cozy nests in platinum plates and bridges are already ready for them. "This year we decided to get rid of foreign dependence," says Comrade Rakov. Before we imported stones, hair springs and hands from abroad. Now we make the hands ourselves and we are establishing the production of our own stones and hair springs.



We walked along the gear train shop. "This is our chief mason, Katsenelson," Comrade Rakov pointed out to us. "What are you? a bricklayer?" "I am! I am a metal worker, not a bricklayer" Comrade Katsenelson exclaimed. I recognized him at once: it was he who handed the banner to the machine shop at the factory conference.

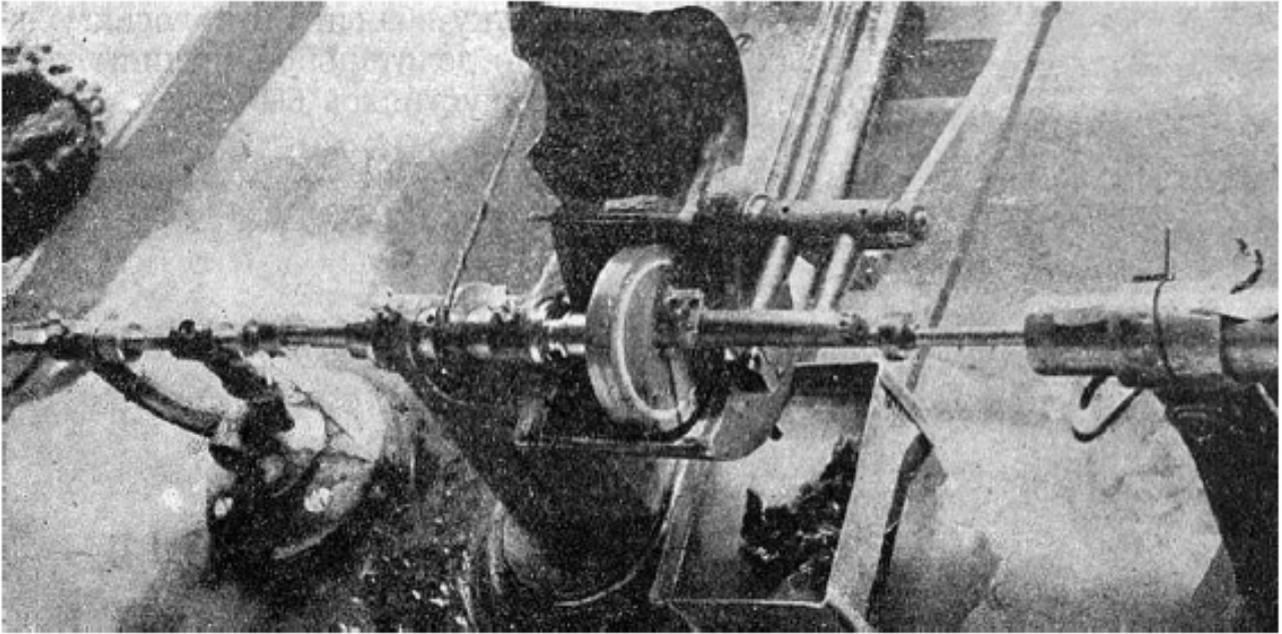
"It's just an accident that I've taken up stones. There was a bottleneck here, they threw me here. He took a small metal comb from the table. "You see, we fill this comb with 25-30 stones the pallets. These stones are then glued into the anchor fork, and the teeth of the escape wheel hit them. They should have a very correct cut angle, some $7\frac{1}{2}$ degrees,

others 13 degrees. Absolute smoothness is important here. And in our case, when grinding and polishing the corner, the pallets broke and crumbled. The assembly reached 100 percent. Now we tuck the stones into the comb and fill them with shellac so that they hold tight. You remove the comb with a high magnification, otherwise you will not see our pallets.



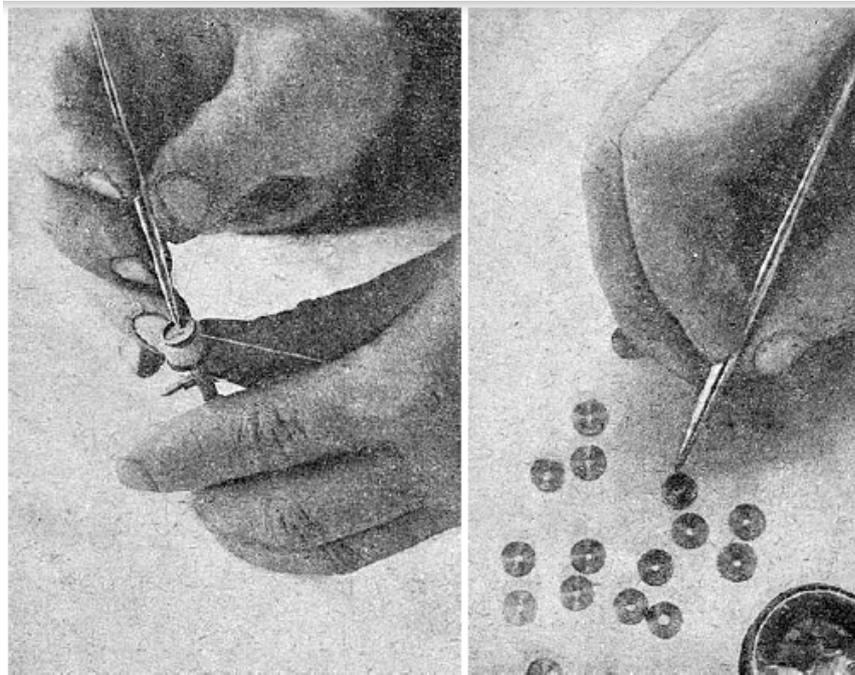
I put felt under the grinding wheel, now it has a soft setting, it hits stones less and serves itself for a long time without turning. To the spindles, on which the circles are fixed, I attached a load pull, now the circle falls on the pallets with the same force. And so that the circle moves forward more slowly, I attached an air pump to the other end of the spindle - like a bicycle. The spindle presses on the piston, squeezes air out of the pump, and you regulate the air outlet with a valve. That's all. Now one person makes twice as many pallets as four did before, and four times less for assembly. And all because my youth took up this business together.

He nodded affectionately at the worker who was tucking the stones into the comb. Limping, he ran for diamond powder for grinding wheels: the diamond is pounded in a mortar, it settles in Provencal oil for 20 seconds to 5 days, then the sediment is rubbed into the red copper of the grinding wheel. Powder No. 1 is heavier and will settle on the first day, powder No. 5 on the fifth day.



Comrade Bunin figured out how to make a hair spring for a watch. Why is there a hair spring in the clock? We came to see Comrade Bunin after work and listened to a lecture on the construction of clocks. When Bunin talks about watches, it seems that they are designed as simply as a pencil. He draws a simple diagram. Here is a barrel with a mainspring. The spring unfolds and the drum rotates. The drum teeth grip the teeth of the central wheel. The center wheel goes full circle once an hour. It drives the second wheel through the intermediate wheel. The second makes 60 revolutions per hour. The second drives the escape wheel. Another 400 turns. The escape wheel, with its fifteen teeth, drives the divider the escapement fork, balance and hair spring.

If it were not for the indexing mechanism, the mainspring would have opened immediately. And the dividing machine works like this. The tooth of the escape wheel hits the very pallet, which has been so precisely polished by the jeweller Katzenelson. Then the anchor fork turns and with the second stone stops the clock. All the wheels in the clock stand and wait. But they won't wait long. The truss fork pivoted and pushed the balance coil. The balance ran to the right and twisted a hair spring. The hair spring parted again and pushed the balance to the left. The balance pushed the escapement fork, the fork pulled a stone from the escapement wheel teeth, and the clock started again. This is how they walk: stop-go, stop-go, and in order for them to walk correctly, the hair spring must contract and straighten exactly 18 thousand times per hour. And if the hair makes more than 18 thousand vibrations, the balance will not work correctly. Now you understand that the hair spring is the heart of the clock! It's hard to make. It is made only in Sweden, even America and Switzerland buy hairs for their watches in Sweden.



Comrade Bunin takes out an old shabby box from his pocket. He takes a piece of paper out of it, unfolds it and shows us the blue, flat, tightly curled springs of steel. They are like tiny gramophone records.

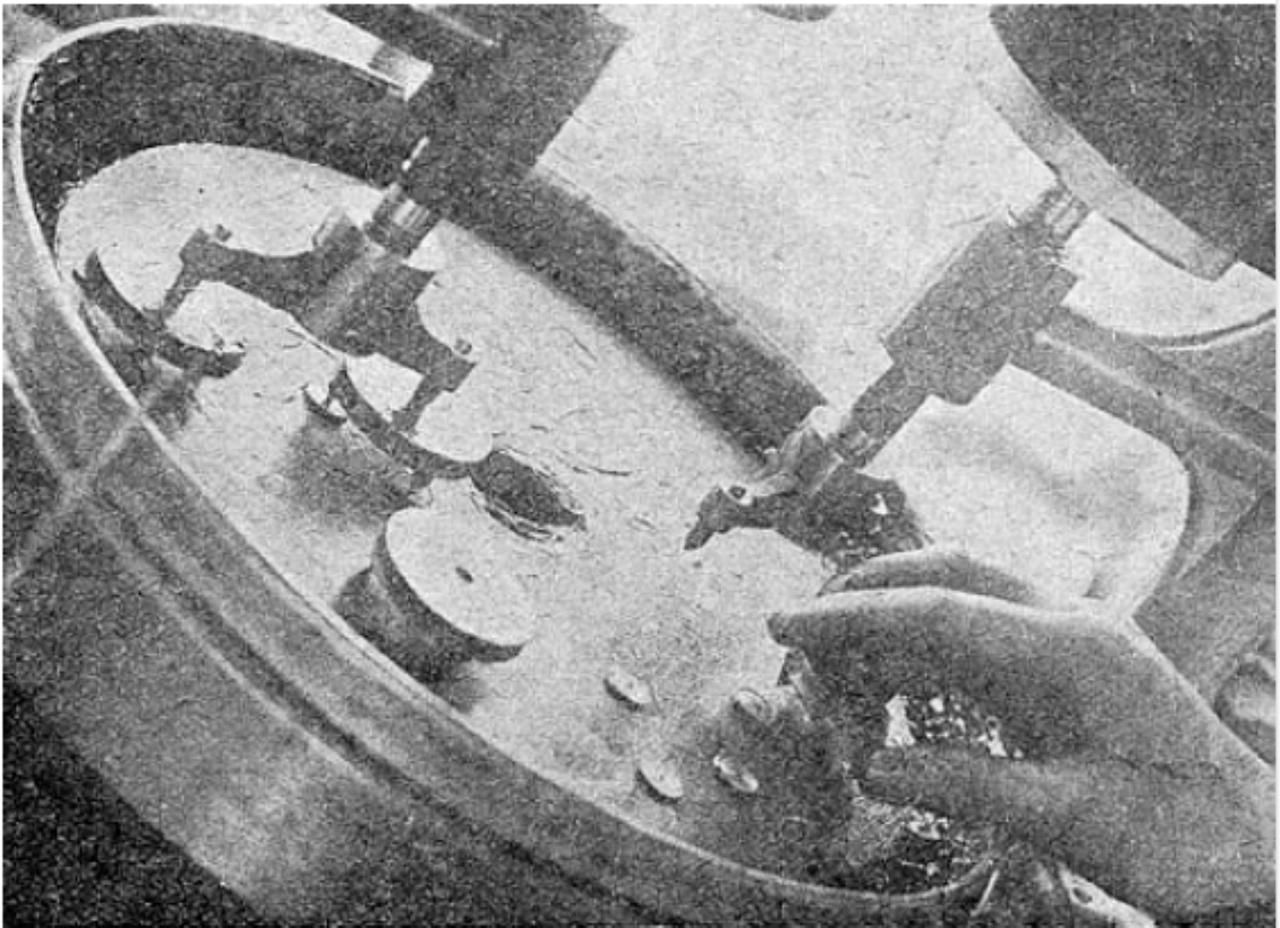
These are my hairs springs. They are not worse in quality than Swedish ones. He shows us a tool he invented for winding hair springs. A pea-sized drum rotates on a thin rod. The rod releases steel paws and grabs three straight springs. They are curled up in a drum in three springs, then heated to a certain temperature so that those removed from the drum can no longer straighten, they are hardened again and the hairs are ready.

Bunin talks about a thousand difficulties that he had to overcome. He started working for a watchmaker when he was 12 years old. Then for many years he lived as a single handicraftsman in a small town. Those were boring years. And now he is a worker of at the state watch factory, a drummer and knows why he lives. He makes great hairs springs for Soviet watches.

Foreign experts and the factory management called his work on the hair springs handicraft, and the inventor's heart squeezed like a steel spring. Imagine: in the autumn, in wet weather, when it rained, they took a watch with my hair spring and put it in a fan for 18 days! Although the hair is a little rusty, the watch is only 12 minutes behind. But now I have already found a way to prevent hairs from rusting ... The Bureau of the Party Collective helped Bunin to promote his invention. He was transferred to the design department to complete his work. We found foreign diamond formers at the factory, and the wire for the hair springs is pulled through them so that it gets elasticity and good polishing. The material for the hair springs will be made by the Hammer and Sickle plant. On the table is a drawing of a new invention, a semi-automatic device for curling steel hair springs. The life of an inventor is in full swing, because his hair spring has won.



Komsomol member Verenikina is working on the forty-fifth operation in the gear train department. The Komsomol of the factory is fighting together for the quality of Soviet watches. Verenikina uses a tiny screwdriver to screw the screws into the balance. Not long ago an inspector was sitting next to her. He checked that the screws were well tightened so that there was no defect. But all screws are screwed down tightly. The inspector has nothing to do: Verenikina had left him without work. There are no unemployed in the Soviet Union. The inspector was transferred to another operation.



Before moving on to the installation shop, we also looked at the grinding of the screws. They are driven into a plate the size of a penny, sprinkled with rosin, the rosin is melted. Now the baby screws will not fall out of their nests. You can turn the penny over, the screws will be on the head. The fingers of the machine will grab the pennies and begin to grind the heads of the screws sealed in the spots.



All parts are delivered to the assembly shop. In the installation, every detail will be measured again. Then they will pick up the parts by sets. Here is the platinum plates, here are the bridges, here are the wheels. The wheels came here gilded and mounted on an axle. And the bridges still need to be sent to nickel plating. Sets of bridges and plates in separate slots go to the electroplating workshop.

Details made in different workshops get to know each other, shake hands. Now they will live together their whole lives. While they are assembled on temporary, mounting screws and planted in temporary cases-boxes. But the assembly shop is close by. In the electroplating shop, cases, platinum plates, bridges take a bath. They have been prescribed different treatments. The cases are bathed in a solution of chromium salts, an electric current is passed through this solution. Then metallic chromium is released from the solution and is deposited in the thinnest layer on the bodies, lowered into the bath. Now the cases are not afraid of rust and scratches: they are dressed in a waterproof coat, they are dressed in a chrome armour, which is harder than steel. The cases are chrome plated. Bridges are nickel-plated. The wheels are gilded. The dials are silver, then the numbers are rolled on them with black paint. The watch came into assembly. Details are outfitted in chrome and nickel. The wheels are gilded. The seconds, minute, hour hands are waiting: now they will begin their journey. They are happy to get out of the pantry that looks like a pharmacy.

Accuracy!

Assembly is the mirror of all workshops: the quality of their work is checked here for the last time. Here the balance screw is weighed on a scale. They compare the new balance with an exemplary balance: the new one must keep up with the proven one, all 18 thousand vibrations of one hair spring must coincide with the vibrations of another.

The journey has begun. The clock ran and stopped. Dzanaeva from the shop, and the jeweller Katsenelson, and Rakov, our guide, and Verenikina, and Bunin, and Teplyakov, and the hero of Perekop, a one-armed Chinese man who works as a counter in a mechanical workshop, put their hand to this little clock. The drummers of the First State Watch Factory proved that for them labor is a matter of honor, a matter of glory: they made a good, faithful, accurate Soviet watch.

We were returning with a friend from the country of Gulliver's.

Four months ago, in December last year, we attended the factory conference, heard how the factory took upon itself the obligation to release 70 thousand good quality watches in the fourth year of the first Bolshevik five-year plan. Just in the same hall, in the club of the First State Watch Factory the new director of the plant, Comrade Leshchinsky, reported about the victory. The plant kept its promise: in the first quarter the plant fulfilled the program by 100.6 percent, in April - by 104 percent.

"These numbers are the music of our plant,"

I thought. And at that very moment, as if reading my thoughts, the comrade said:

"These figures are the music of our engineering industry! Tomorrow is May Day. How many factories and construction projects will report their victories tomorrow!. "Sharik" and "Fraser", Dneprostroy and Kuznetsk, open-hearth furnaces of Elektrostal and blast furnaces of Magnitogorsk will come out tomorrow on the square with the music of victories. This is the funniest music ever. This is the music of socialism!

M. A. Gershenzon

Note.

This is my personal interpretation and certainly not a literal translation. Some words like 'hours' have been substituted by 'watches', 'arrows' by 'hands'. The language of that period, so heavily weighted, has been left as much as possible and therefore some passages may be difficult to understand..

The original is readily available for those wishing to cross reference my version.

AG 2020