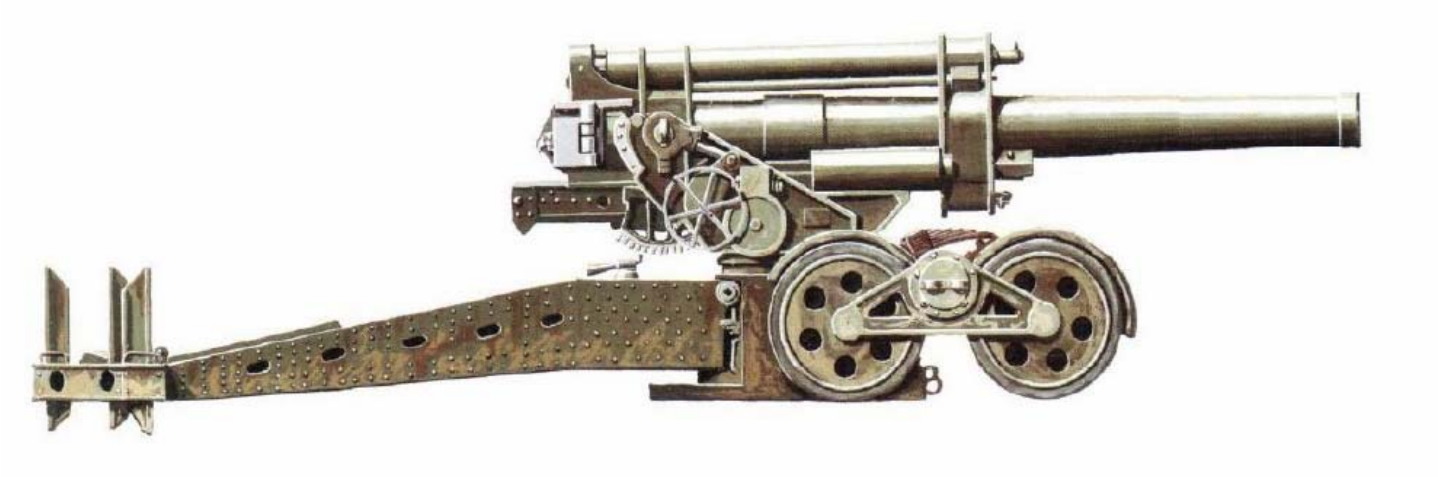
The 21 cm howitzer including the details of the ammunitions (HU WW II)

Teil 1

von András Hatala



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1. Preface

Instead of introduction we should discuss the reasons why the surpreme command thought the 21 cm heavy batteries to be so important in the Hungarian Army. Hungary became a small country after bring losing World War I in consequence of the Treaty of Trianon. Nobody could accept but there was nothing to be done because the Hunagrian economy and the Hungarian military forces and industry were inspected by the wining counties' delegations.

These inspction times lasted till 1930 but the restrictions were still valid officially. During this decade all artillery weapon which were bigger calibre than 10 cm hibernated. This deep sleepy pieces were hidden in the countryside in various places (barns, sheds, farm-buildings) as disattached agricultural machines.

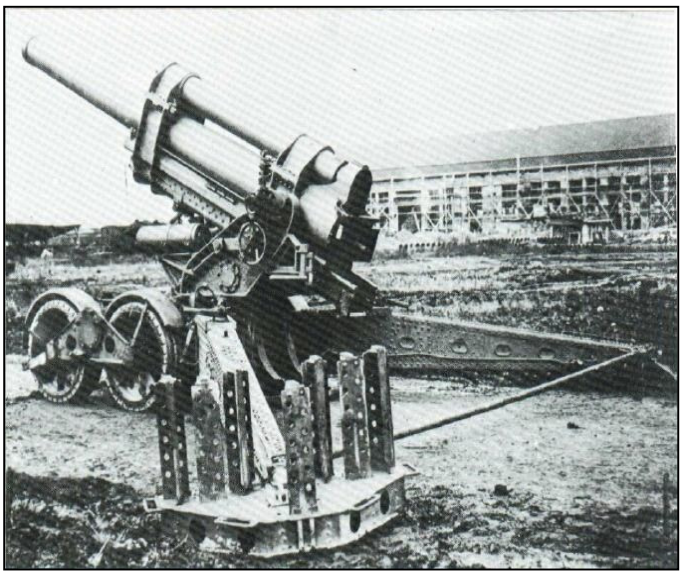
In secret the training started with these saved pieces. Firstly with 15 cm howitzers later with one 16M 30,5 cm mortar. All firearms were the old Austo-Hungarian production and according with this the ammunition too. This caused a lot of accident. Usually the shells broke during the firing or crushed into the ground. Once one 15 cm gun exploded in Ruzsor-farm, near Hajmáskér all gunner died. The driving band did not functioned properly.

Around the country all states built fortifications and fortified lines. The politicians wanted to win back the lost areas mostly without the using of military force. They counted on the Germans help. According with it developing the heavy artillery was important but everybody knew that the old mortars were not enough to satisfy this need. All old Austro-Hungarian 10 cm and bigger calibre guns were modernised and fitted with newly developed concrete-piercing shells, but it was clearly seem that a new type of howitzer needed to fill the gap in the firepower.

2. Servicing and producting of the howitzer

The high command decided 21 batteries with 2 guns each. The planned calibre was 21 cm and wanted to buy and/or home produce 48 pieces of guns..

Like in all military items importing from „friendly" countries seemed to be the best solution. Home development without experiences was turned down. The Germans refused as usual (for their 21 cm Mrs.18 gun's licence fee 2 billion RM). The Hungarian Military Technical Institute suggested the Italian Ansaldo's howitzer. The military-engineers followed its developing procedure with attention from the begining, and carried on successfully ended negotiations to get the producing plans and licenses. This gun was the latest development of the gun factory in Pozzuoli and the first produced 70 pieces were also brand new in the Italian Army.



***Pic. 1* – The first ..Obice da 210/22 modello 35"**

Meanwhile, till the gun factory in Diósgyőr (Hungary) prepared itself for the producing, they ordered 8 howitzers from Italy. The Italians delivered them from their first lot as well. 6 arrived at autum 1939 and the last 2 in January 1940. Their original name was: Obice da 210/22 modello 35 but in Hungary officially called as 21 cm 39M heavy howitzer.

Despite the delight the gun's

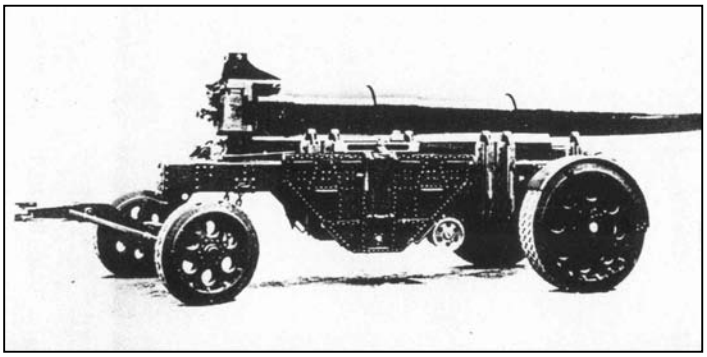
weak points soon appeared because of the faults in its constuction and production. The gun factory had to work a lot to put the useless 21 cm's back to service. The Military Department ordered 12 howitzers from MÁVAG (Diósgyőr). The factory claimed and granted a 1,5 billion Pengő deposit – 150 Pengő was the average dream salary of that time – because of the corrigation work on the gun's original construction. The production price and deadlines remained open until the end of the changes on the plans.

During this time the Italian Army recognised that the gun is not a useful piece. Therefore the Italian Military Technical Institute changed a lot of parts on the howitzer. But they held back most parts of this modified documentation. In April 1940 arrived the modified drawings of the barrel and the breech and 208 plans from the other remainig 250 drawings. No surprise that to inspect these drawings and make the changes took more months and the hoped handing over to the Military Department in December 1940 was impossible.

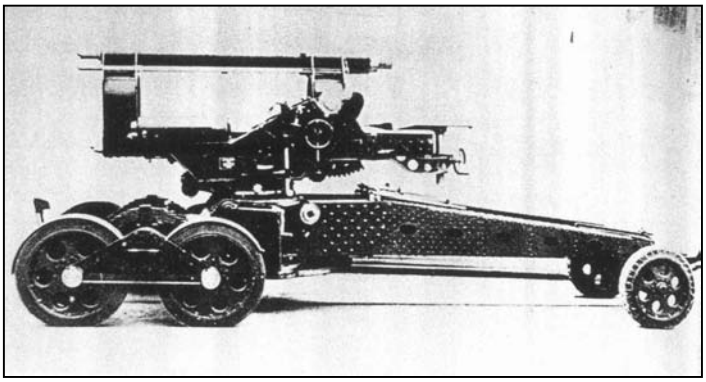
Although the starting time of the home production was still postponed the surpreme command did not give up the wants to strengthen the heavy artillery. They liked to order 26 other guns in spring 1940. The chairman of the gun factory (MÁVAG, Diósgyőr) promised they could make 18 guns in 1940 and 20 piece in 1942 if all drawings and machine-tools arrived during 1940. The gunmakers had great interest in beginning the mass production bescause the 21 cm Howitzer gave the spine of the whole factory-production. Instead of the promised 26 pieces, the Military Department ordered only 14 pieces. One howitzer's price calculated between 380000-500000 Pengő, not as a final cost.

The production did not start at the end of 1940. During the process due to the lot of stopings, beginings and corrigations the originally planned 30000 hours of one gun's manufacturing time raised by 20%.

Finally in autum, 1941 the first piece was finished and as 40M 21 cm heavy howitzer serviced in the artillery battery. It was much better than the Italian 39M but it still was not the ideal solution. The mass production (1942-1943) ended with the last piece from the ordered 26 in September, 1943.



***Pic. 2* –The Hungarian 210 mm 40M heavy howitzer barrel car**



***Pic. 3* – The Hungarian 210 mm 40M heavy howitzer lafette prepared for transport**

3. Ammunitions

3.1. History

Parallel to the guns there was trouble with the ammunitions, too. During the tests the Italian 101 kg HE-shells failed. A lot of shells broke in the barrel when they were fired with the biggest powder charge. Barrel explosion did not happened.

In Hungary the other „main" shell was the concrete piercing. The Italians started to develop a 107 kg shell specially for Hungarian request in mid 1938. The tests were executeed in Italy in a naval test area at see shore with Hungarian inspection. But the shells showed poor performance.

The Hungarian Military Technical Institute had to make the decision to start developing the Hungarian ammunitions immediately. The tests were executed against bunkers, small forts ands concrete walls wich were built specially for these tests by the inspection of the Military Technical Institute in Hajmáskér-Várpalota shooting range. And at the same time they ordered an Italian company to make the shells perfect because in 1939 the Hungarian ammunition mammuth Manfred Weiss, Csepel was still unable to make 21 cm shells. After the elimination of the faults, Hungary ordered 1400 HE and 5000 CP shells in March, 1940.

But there were still problems with the CP shells. In one hand the transports always overstepped the deadlines and arrived late, on the other hand they had poor material quality. Some CP shell's windshield cup broke during firing.

In April 1940 general Henrik Werth – that time chief of the general staff – ordered the second line using the ammunitions of Italian origin. These shells were alloved to be fired only at practising when the artillery was alone – military practice without infantry, tanks, etc. – because 40% of the shells did not explode! And this ammunition was not enough safe at handling and firing.

Hungary gave up the import in December, 1941. This time the Manfred Weiss factory produced 100 pieces/day from the 21 cm calibre and this quantity was over the Italian capacity.

Here is some scraps which allows us to inspect to the ammunition productions.

- 10th of July 1940. A report stated that Manfred Weiss factory had behind with the following 21 cm ammunition quantities:
  10000 pieces of 39/34M CP shells;
  480 pieces of 39/33M HE shells.
- In authum 1940. A military leader meeting fixed:
  The possible ammunition production capacity was 110 pieces /day. It had to reacing up to 144 pieces/day.
- The end of 1940. The MÁVAG joned into the 21 cm's production, because of the continuous manufacturing problems. Although the ammunition needs from this calibre were low.
- In September 1940. The ordered 21 cm ammunitions from Manfred Weiss:
  2300 pieces of 39/34M CP shells;
  420 pieces of 39/33M HE shells.
- In April 1941. Ordered quantity of 21 cm ammunition was 8000 pieces. And the calculated manufacturing time was 4 month.
- In Jun 1941. A meeting the military leaders thought the supply with 21 cm ammunition was enough.
- 1st of August 1943. The Manfred Weiss company had to produce 14100 pieces from the ordered 17100 pieces of 21 cm ammunition. The plan gave

explanation: the late handing over and faulty base fuses from Telephone and Brenner factories.

- Finally here is a report in November 1943. This summarizing the orders in 1942-1943.

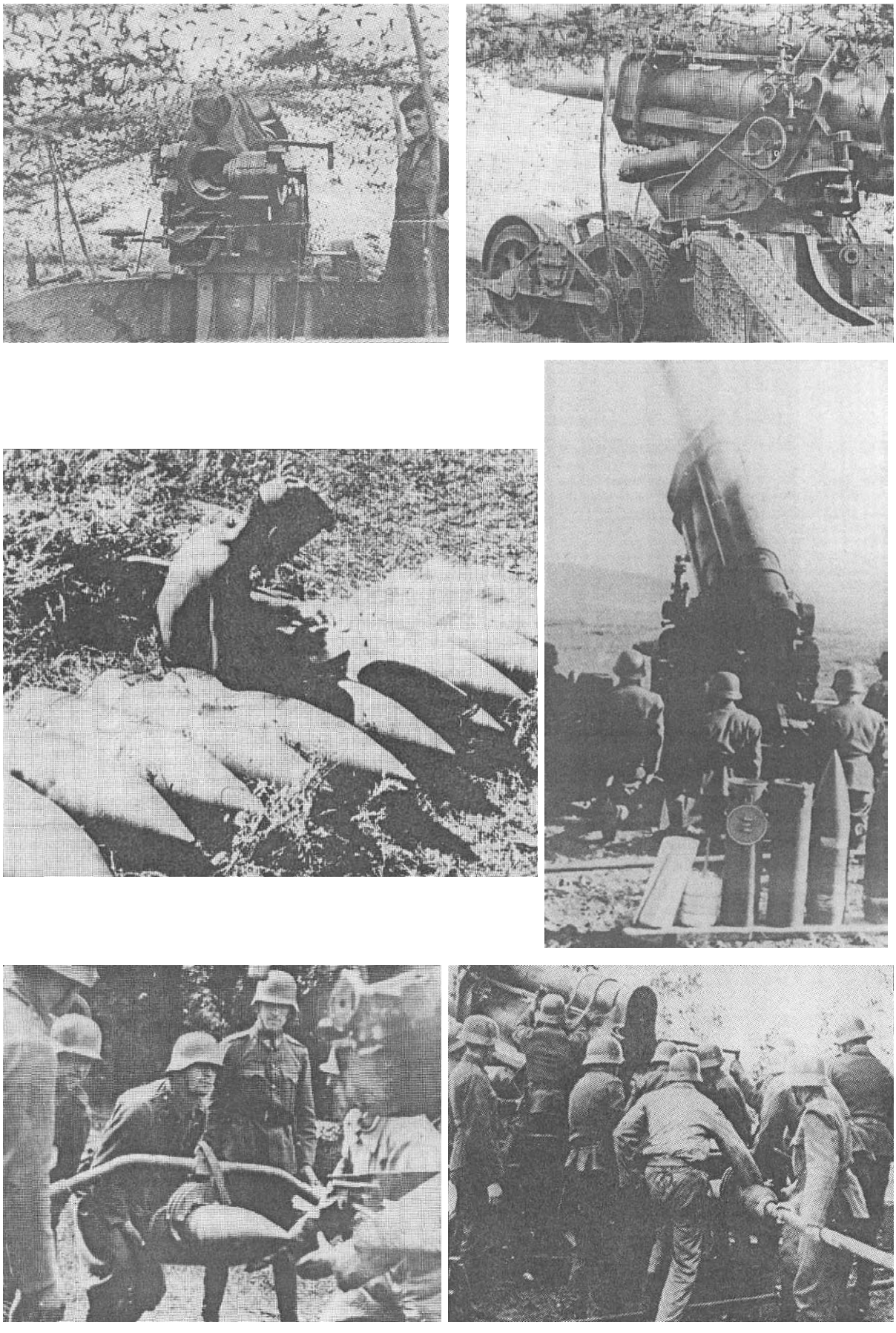
21 cm 33/39M HE shell

Year	Ordered pieces	Handing over pieces	Still in production (pieces)	Manufacturing time
1941	1250	1000	250	10 month
1942	2000	---	2000	7 month planned assembling in May 1944
1942	1000	500	500	12 month
1943	500	---	500	planned producing in May 1944

21 cm 33/34M CP shell

Year	Ordered pieces	Handing over pieces	Still in production (pieces)	Manufacturing time
1942	3500	1000	2500	14 month
1942	4000	---	4000	11 month
1942	800	---	800	5 month
1943	5000	---	5000	planned producing in April-Jun 1944

At the end of the war the ammunition factory in Csepel became ruined due to the series of American bombing. The remaining 21 cm batteries could get ammunitions only from the warehouses. In August 1944 the Military Department ordered 15-20000 shells from Italy. But all Italian factories were in German hand. The Germans promised but finally there was not enough time to do it.



***Pic. 4-9* – Practice at Hajmáskér shooting-range**

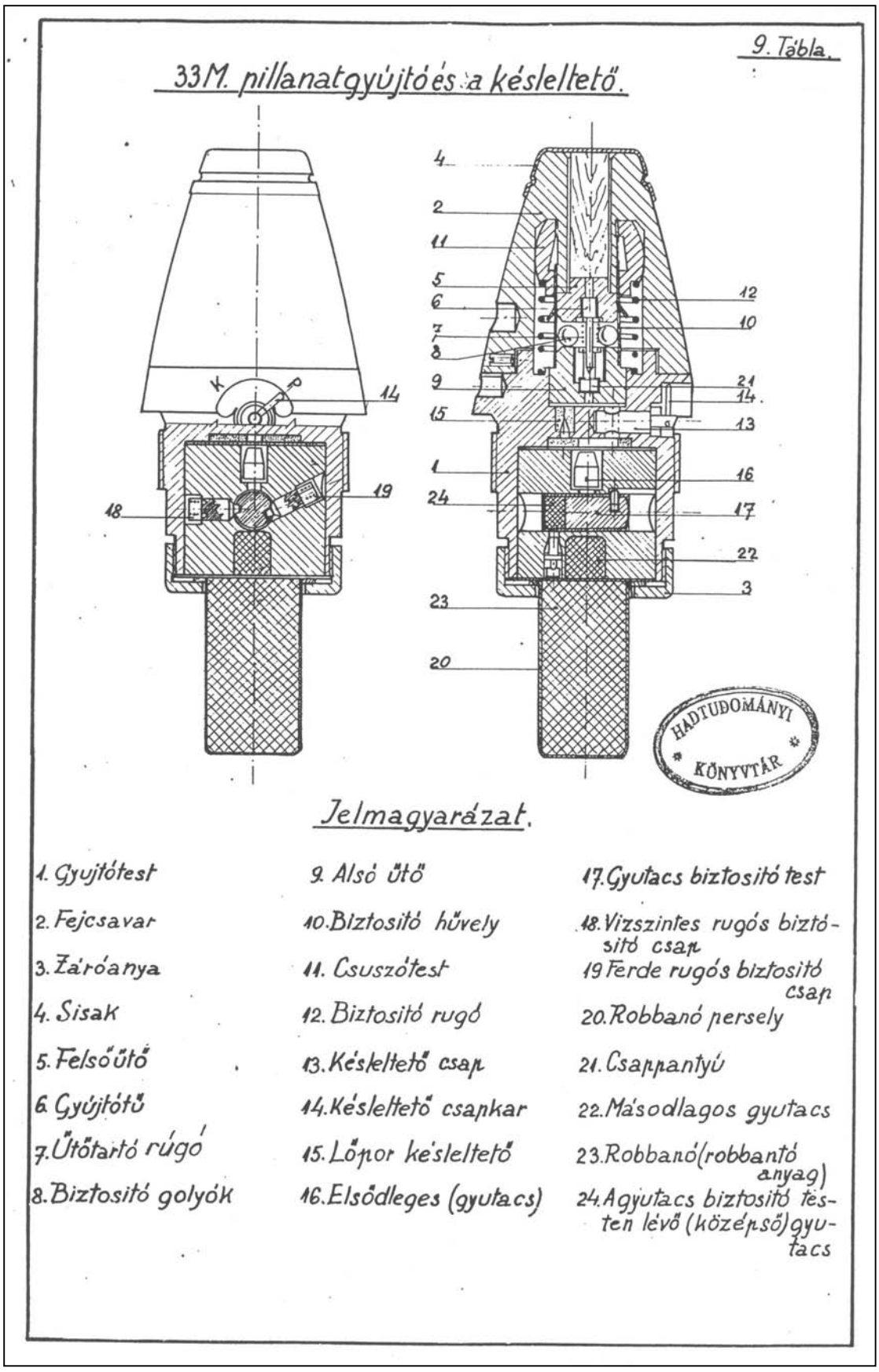


***Fig. 1* – Hungarian 33M head fuse**

3.2. Construction *(see the drawing at the end of the chapter)*

The home developed and manufactured ammunitions were made in high quality. They were very useful pieces.

We known two types HE shells. Generally their shape is the same, the only differences between them is the producing method.

The 40/33M body consists of two pieces. Both of the parts were made by pressing, finishing on lathe-machine. The explosive was filled by molding separately in each piece, between them there were paper spacer discs. The explosive was usually 60/40 TNT/amatol and this charge initialled through a long TNT rod in the headpiece. The fuse was the generally used 33M headfuse. It had one copper driving band with three small grooves. The driving band transmitted the rotation to the body by small pyramids on the base of its groove. One groove was placed under the driving band. Yet, we don't know why.

The 39/33M HE shell had monoblock body. To fill it wormscrew pressing machine was used. It had a small mouth screw which joined the fuze to the shell.

The fuzes were secured by small wormscrews and fitted with cap to protect them against moisture. This cap was made of brass sheet and soldered by a wire to a washer shape brass ring under the fuse. The gunner could tear the soldering by the wire and his hand with a circular move around the fuse. The fuse wasn't so complicated. Impact action with graze mechanism and it could be set for delay action too. It was bore safe and had a big booster charge.

Before firing the artillerist set the fuse between the impact or delay action. At the setting No.14 arm the K ('Késleltető') sign showed the delay action and the P ('Pillanat') is the instant action. During firing in the bore No.11 inertia weight moved down aginst the No.12 spring. The No.10 safety tube had 6 small wings which clicked into the inertia weight inside groove. All parts remained in this position during the bore.

When the shell entered its outside trajectory, the No.11 inertia weight and the No 10 safety tube were moved up caused by the No.12 spring. The 6 steel No.8 ball moved away from the No.5 upper- and the No.9 bottom hammer. The upper had the No.6 needle, the bottom had the No.21 primer. Between them the No.7 spring was placed. The instant action worked through the wooden stick in the nose. At graze action the No.9 bottom hammer with the No.21 primer ran onto the needle.

The flash passed across the No.13 setting pin's hole at instant action. If it turned and closed the way the flame went across the No.15 delay powder pellet.

In both cases before the flame reached the safety unit, it burnt a powder charge above the No.16 detonator. The safety unit was a No.17 slipping weight with a small No.24 tetryl charge. It was placed outside the firing chain. Its shape was cylindrical but could not turn in its hole because of the small pin which was driven by a small straight groove in the hole. It was fixed with two No. 18 and No. 19 centrifugal pins. They opened only when the shell passed through the howitzer muzzle and the centrifugal force highly developed. The No.17 slipping weight moved the centrifugal force, too. In this armed position the weight was fixed by a small spring drived pin – you could see it under the No.24 charge on the Figure 1 -.

The firing chain was complete the fuze could work.

Two concrete piercing shells were possible: the 39/34M and the 42/34M. Both of them are the same, the only difference is in the driving band. The first and the early type had copper driving band – same as the HE – the second or later type had 3 simple iron bands. There was not a groove underneath them.

The shells centerising bourrelets were under the head and over the driving bands. The ballistic cap was sheetmetal screwed-on type. On the shell it was fixed by 8 pieces of small warmscrews. The base screw was made with two large wrench holes. Sealed against the

ressure by lead wire between the body's circular rim and the basescrew circular groove. The base fuse was inside the shell screwed into the base. The base had small explosive charge covered by paper, but the main TNT filling was quite big.

The base fuse was the 34M. It worked like the 33M headfuse. A lot of parts were absolutely the same. Naturally it could operate as only a graze fuse. A fixed needle with flasholes. Both types were possible: with the normal graze function or with delay action. The first type did not have a delay screw over the needle. The type of the fuse was stemped on the shells side over the driving band like 'K-vel' (delay action) or 'K-nélk' (normal inertia work).

The powder charge was sewed into silk bags. There were 6 charges:

- 1st - put down the 2nd, the 3rd and the 4th charges from the central powder tube;
- 2nd - put down the 3rd and the 4th charges from the central powder tube;
- 3rd - put down the 4th charges from the central powder tube;
- 4th - load the complete 1st, 2nd, 3rd and 4th charges together;
- 5th – from the 5th charge put down the 6th, surrounding charge and load the 5th only without the the 1st, the 2nd, the 3rd and the 4th;
- 6th – load the 5th with the surrounding 6th charge, omit the other charges.

The igniter black powder charges – sewed on the bottom of the 1st and the 5th charges – and up to 4th charges the central tube had to be inderted. Mixing the different powder lots was prohibited. The whole charge was packed into sealed steel container.

The igniter was the 40M, a „normal" 8 mm 31M Mannlicher (8x56R) case with paper plug and full powder charge. This was placed into the gun's breech.

The shells and the powder container were single packed into wooden baskets.

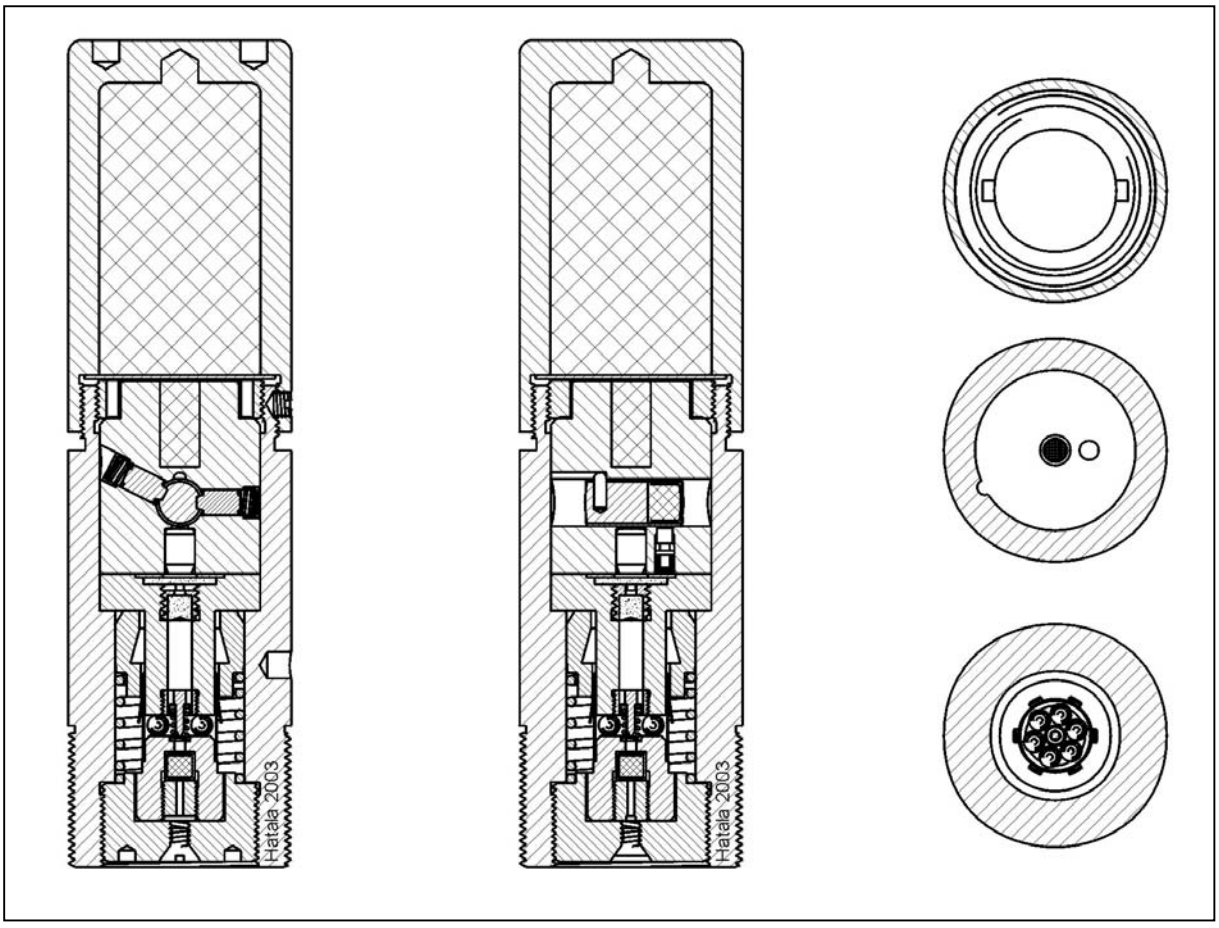
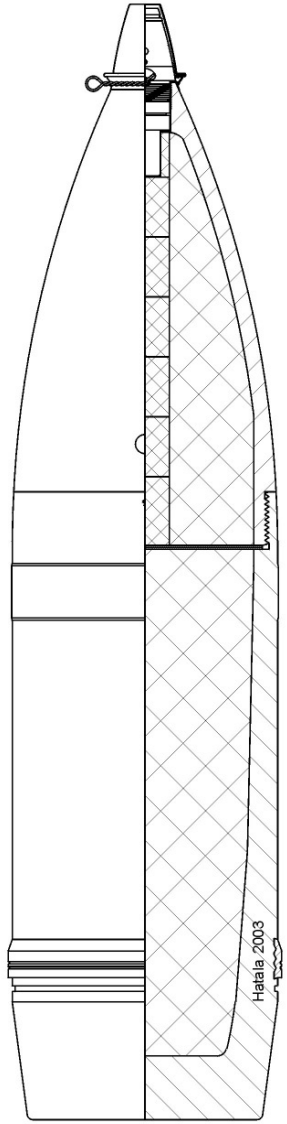
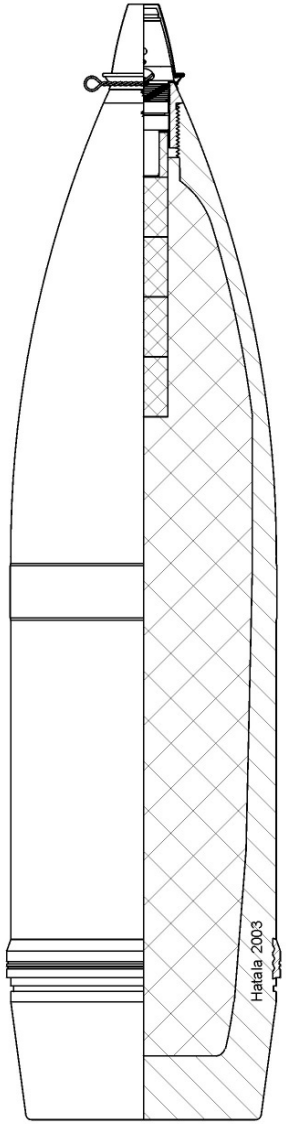


***Fig. 2* – Hungarian 34M base fuse**

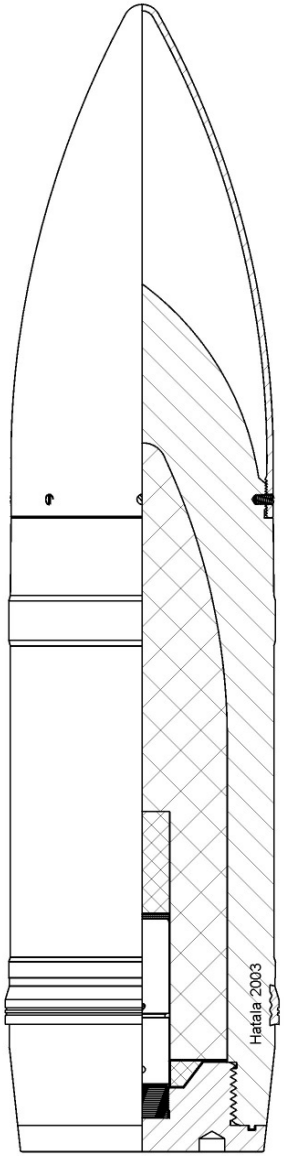
210 mm Hungarian 39M, 40M and 40aM motorised heavy howitzer ammunitions



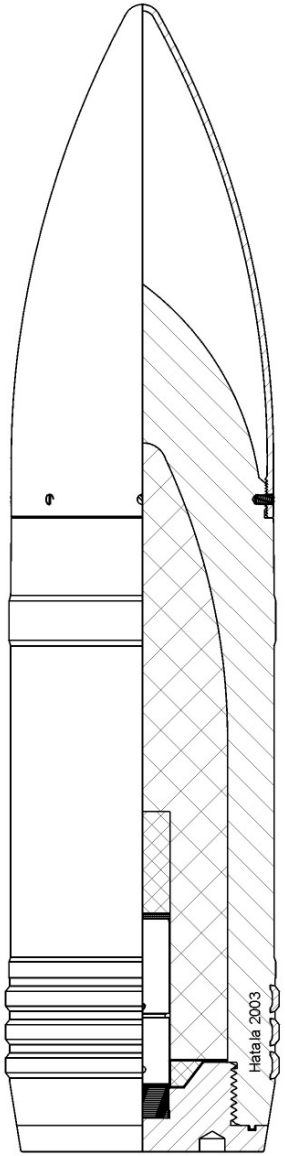
210 mm 40/33M
high explosive shell



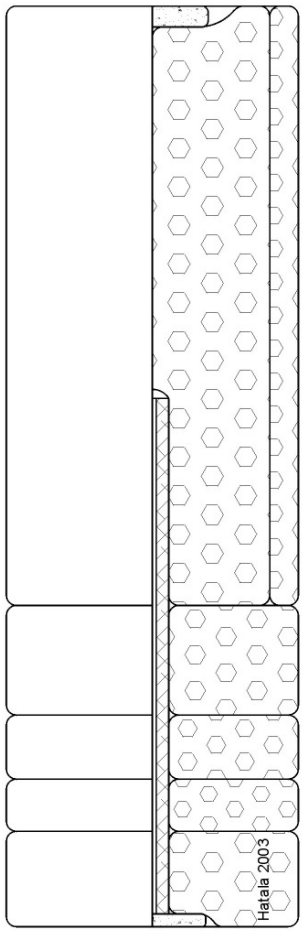
210 mm 39/33M
High explosive shell



210 mm 39/34M
concrete piercing shell



210 mm 42/34M
concrete piercing shell



210 mm 39M
full powder charge

40M primer
(8x56R)

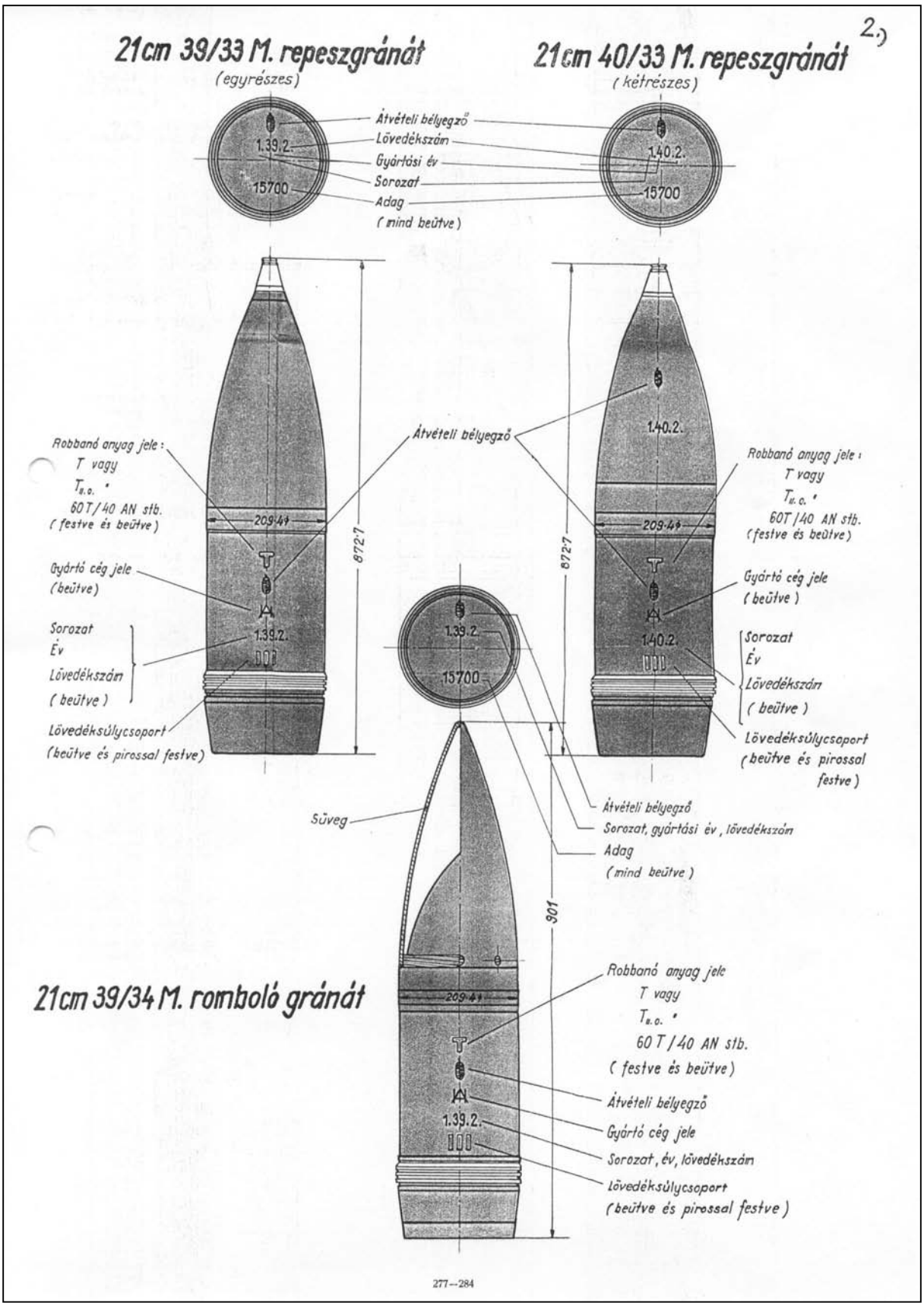


***Fig. 3* – Hungarian 210 mm hovitzer ammunition types from the shooting table manual**

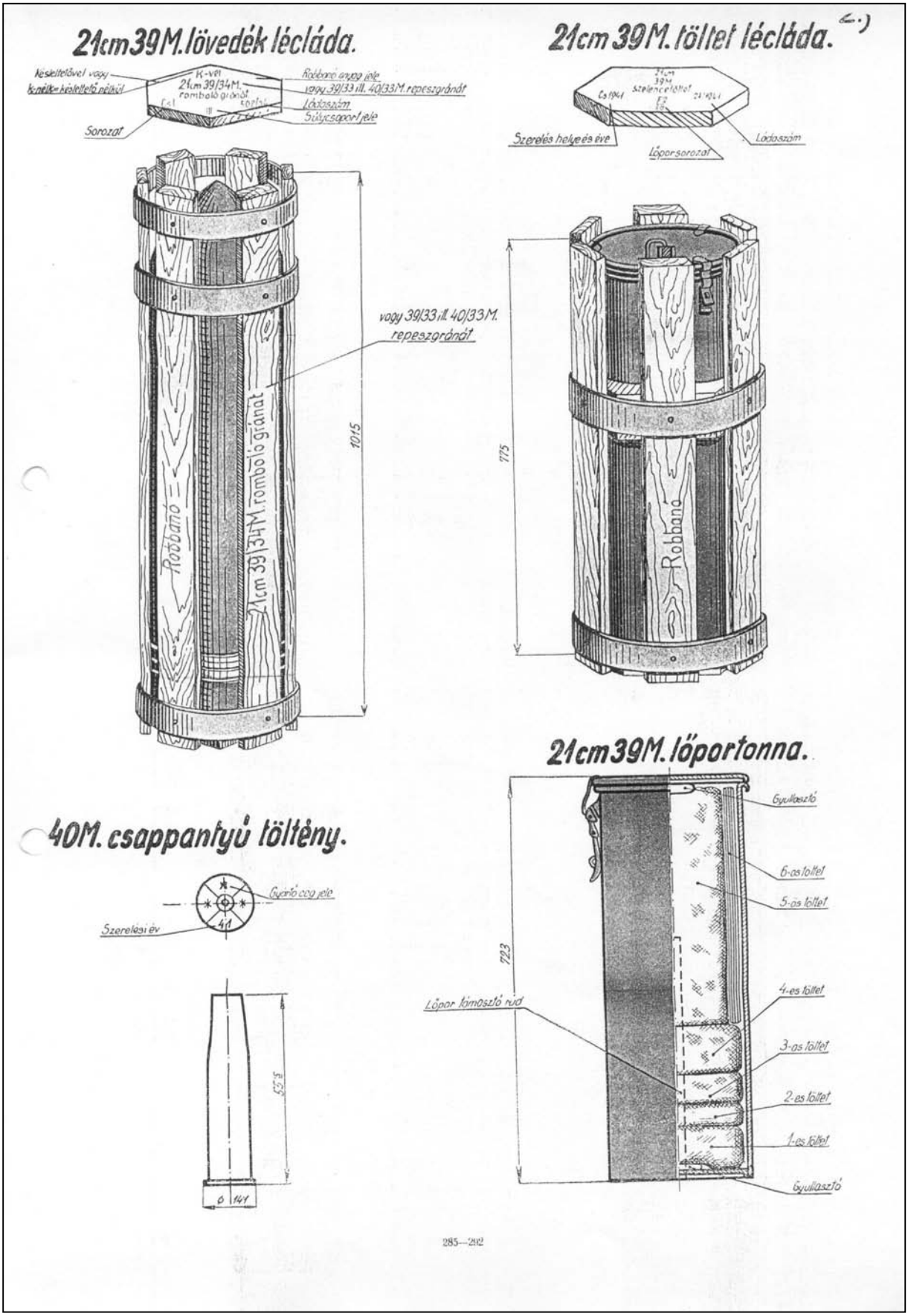


***Fig. 4* – Hungarian 210 mm hovitzer packing baskets, powder container and 40M igniter from the shooting table manual**