The Man Who Saved the Hamilton Model 21 Ship’s Chronometer

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During the initial days of World War II, the U.S. Navy suffered a crisis. To find their positions at sea, ships needed an accurate timepiece—a chronometer. None were available in the quantities needed. Hamilton Watch Company had a contract to produce them but believed the detents could not be mass-produced. They believed that they could only be handmade and they had only three people who could make them. Thus, there was no hope that they could fulfill their contract.

The detent is a part of the chronometer escapement that allows the balance wheel to pass the detent on one of its arcs, but to trip it during its other arc to deliver power to the balance wheel from the escape wheel. On an anxious day at the beginning of World War II, my longtime friend V. E. Van Hoesen said to me, “Hamilton has a large contract for producing a chronometer. They don’t believe that its detent can be mass-produced. I know it can and I’m going to mass-produce it for them.”

During my initial trip, I stopped at the first watchmaker’s place that I came to, the shop of Mr. Homer Harris. He was a kind and helpful man, and I made that my headquarters for each of my Memphis visits. From there, I visited every watchmaker within walking distance. Thus, rain or shine, each Saturday during my high school years were spent visiting the Memphis watchmakers.

During one of these trips, a fellow in his thirties, V. E. Van Hoesen, came to the Harris shop to show Mr. Harris a new part he had just completed for a watch he was making from scratch. A man of extraordinary skills, from a family of watchmakers, Van Hoesen also did restorations of rare watches owned by Major Paul Chamberlain, the author of many articles for the then-popular magazine, Horology, published by Lewis and Samuel Levin of California. (Following Chamberlain’s death, his wife had these articles published as a book, It’s About Time.)

Because of Van Hoesen’s exceptional skills, I made it a point to spend as much time as possible with him during my Saturday visits. Thus, he taught me many things about watch repair that others lacked the ability to teach me. Since he called the watch he was making during that time his Number 8, it is reasonable to assume that he had made seven others before starting work on it.

When completed, he sent it to the laboratory of the magazine Horology in California to be given a quality rating. It was so well made and kept such perfect time they didn’t believe an American craftsman could have made such a perfect watch. He had to obtain affidavits to prove that he had made it. Such was the mechanical genius of my friend Van Hoesen.

By now my high school days were over and I was working as a watchmaker in Memphis, but I still visited Van Hoesen. During my last visit before joining the Air Corps
Many years later I read the 1981 Marvin Whitney book, *The Ship's Chronometer*, which described in detail almost everything associated with the Model 21 chronometer. I was astounded that no mention was made of the contribution by my old friend, Memphis, TN, watchmaker V. E. Van Hoesen, the man who had essentially pulled Hamilton’s chestnuts out of the fire and made it possible for them to fulfill their World War II contract and for the United States to put their ships to sea.

I wrote Marvin Whitney to tell him what I knew about the Van Hoesen mass production of Model 21 detents and wondered why he had not mentioned the effort in the book. His reply was very curt, saying that he knew everyone at Hamilton who worked on the chronometer and Van Hoesen was not one of them. Of course, Van Hoesen did all of his work in the Memphis jewelry store of A. Graves & Steuwer and was not a part of the Hamilton factory group. I doubt that he ever visited Hamilton. This left me very upset.

Many years later, I read the 1992 Don Sauer book, *Time for America*, which is a very detailed history of the Hamilton Watch Company. Again, nowhere in the book was there any mention of the contribution made by Van Hoesen and his production of the Model 21 chronometer detents. This really upset me, so I talked with Henry Fried about the problem and was told that Hamilton seldom ever gave credit to anyone who had helped them.

In a later attempt to contact Van Hoesen, I learned that he had died. Not being a research type, I finally dropped the matter. However, it continued to bother me that Van Hoesen had never received credit for his very important work on the Model 21 chronometer.

In desperation, a few years ago I wrote a letter to the *NAWCC Bulletin* in hopes that someone might shed light on the matter. In response to the Bulletin letter, I received a phone call and a visit from a Mr. John Huber, who ran a chronometer repair shop in a nearby town. He had purchased the estate of Van Hoesen and had a large number of unfinished Model 21 detent parts and pictures. These things made no sense to him because he was unaware of
Van Hoesen’s mass production of the Hamilton Model 21 detents in Memphis. (Huber is preparing a detailed article on the life and accomplishments of V. E. Van Hoesen, hopefully to appear in a later Watch & Clock Bulletin.)

Although Huber had detent parts and photographs of Van Hoesen at work on the Hamilton detent project, there was no proof that the parts were being mass-produced for Hamilton, which left only my word that what had been produced were actually Model 21 detents. Thus, I lacked proof of what had happened and decided I could do little with the material to correct the Model 21 history.

Recently, I was contacted by a distant relative of Van Hoesen, Patti Hobbs, who is a genealogist studying the Van Hoesen family. Apparently, she had come across my earlier letter to the Bulletin asking for help in the Van Hoesen case. During extended correspondence, she has been able to produce articles of proof that the Hamilton detents were produced at A. Graves & Steuwer in Memphis, TN.

Using her genealogy training, she found a 1943 letter from Hamilton begging the Chief of Bureau of Ships for help in obtaining machinery for A. Graves & Steuwer for the manufacture of the Model 21 detents needed to complete their chronometers (Figure 2a), and an undated letter from A. Graves & Steuwer Company to Milton Manby asking for help in expediting delivery of the equipment (see Figure 2b, next page). This undated letter is most likely the letter referenced in Hamilton’s letter to the Navy (see Figure 2a). It may have no date because, lacking photocopy methods, the transcriber failed to copy the date along with the contents. Patti Hobbs also produced a Missouri newspaper article, from The Daily Capital News, Jefferson City, MO, dated Wednesday, August 25, 1943, describing the work on chronometer parts being done by V. E. Van Hoesen in Memphis (see Figure 3, next page).

Figure 2a. Hamilton’s letter begging the U.S. Navy for help.

With this information at hand, I felt that I could finally write an article correcting the history of the Model 21 chronometer. At age 90, I think that I am likely the only one alive who knows the history of the Van Hoesen detent manufacture in the Memphis jewelry store.

Unfortunately, during the years since the visit of John Huber, I lost contact with him and many efforts to locate him failed. Finally, I found him by contacting the Chamber of Commerce in the town where he once had his chronometer repair shop. This allowed me to borrow the needed photographs and detent parts.
Mr. Milton Manby  
Hamilton Watch Company  
Lancaster, Penn.

Dear Mr. Manby:

We are discouraged and disappointed beyond words at the conditions which exist with regard to getting our equipment to manufacture detents. We are wondering if there is anything that you can do to help us out of our predicament. It seems to us that the importance of Marine Chronometers is such that some help should be given to ease our machinery difficulties.

For your information our orders on capital equipment were placed through J.E. Dilworth Company of Memphis and are as follows:

Order #4504 L for a milling machine was placed with Van Norman Machine Tool Company of Springfield, Mass., under date of September 26. When the order was placed a delivery date of December 5, was given. This date has since been changed to December 15, December 29, and now January 29.

Order #6352L dated November 25, covering a precision lathe from The Stark Tool Company at Waltham, Mass., now has a delivery date of January 12. You will note that this order date was November 25, this being placed after Harding Bros. had changed their shipping date from November 5, on a lathe we ordered from them to February 15.

A milling machine and precision lathe were both placed on order with definite commitments on delivery as soon as we received the urgency number you extended to us. Our change in original orders has been brought about through postponements of delivery dates and our eagerness to get equipment in time to meet delivery dates you had set. You no doubt know that our big delay in securing this equipment was the priority given to the Aircraft Industry over Navy and Army contracts. We missed getting delivery on our lathe by five days due to this new order.

As mentioned before, it seems to us that the importance of this contract is such that some help should be forth-coming. Won't you please do what you can to expedite delivery of this or equivalent equipment to enable us to do our work for you, or tell us what we should do? Thanking you for your cooperation in this matter, we are,

Yours very truly,

Eugene E. Lott [signature]
A. Graves & Steuwer Company

Figure 2b. A. Graves & Steuwer Co. letter asking for intervention regarding delayed equipment deliveries. This letter may have been referenced in Figure 2a.

Figure 3. Newspaper article about the chronometer parts being manufactured in Memphis, TN.

These items and those offered by Hobbs certainly supply the needed proof that the Model 21 detents were manufactured in Memphis by the efforts of Van Hoesen. The jewelry store where he worked was converted into a factory for the mass production of the Hamilton detents under his supervision.

During my last visit, I distinctly remember Van showing me the E banner his firm had been awarded. He was obviously very proud of it and the accomplishments that it represented. Thus, as additional proof the detents were made in Memphis, a search was made of what firms were awarded the banner. All attempts by Hobbs and Huber to find that the Army/Navy E banner was awarded to A. Graves & Steuwer have thus far failed. There must surely still be records of the firms receiving such an important award. However, they may have been destroyed during the many years that have passed since World War II.

It is my understanding that the E banner was only given to firms and never to individuals. However, had individuals been given E banners, Van Hoesen should have been one of the first to receive one. He was a remarkable individual, highly skilled and with a strong belief in self-education. He had a grand piano in his workplace on the second floor of the jewelry store where he worked. He taught himself to be a concert pianist. He also taught himself to speak a number of languages.
Late in life, his eyesight failed from detached retinas, which several surgeries failed to correct. During his blindness, many of his possessions were sold on eBay by his housekeeping neighbor and her relatives. Some items were recovered before his death. Among them was his Number 8 watch, which he considered his masterpiece. The offenders were finally caught and jailed.

So the reader can better follow what is being discussed here, Figure 4 is an exploded view of the Hamilton Model 21 detent. Item 5 is the completed detent and items 7 through 17 are its parts. For those wishing a larger view of the chronometer, one can be found at the military watch museum's website: www.militarywatchmuseum.com/m21-10.jpg. Without the detent, no chronometers could be completed by Hamilton.

How does a chronometer detent work?

The following explanation is in relation to the parts shown in Figure 4. Unlike a watch lever escapement, which impulses the balance wheel in each direction of its excursion, the chronometer detent impulses the balance wheel in only one direction of its total excursion. A vertical pin on the detent (9) locks the escape wheel but allows the balance to pass by the detent on its counterclockwise motion, because of a very weak spring (12) on the detent: the counterclockwise rotation of the balance wheel will cause the impulse jewel on the balance wheel to bend the weak spring (12), pass it and nothing happens to the detent. On the clockwise return motion of the balance wheel, the impulse jewel on the balance wheel will contact the weak spring (12). Because the weak spring rests against the bent end of (7), it causes the double spring of (7) to bend and allow the pin (9) to unlock the escape wheel. An escape wheel tooth impinges on the impulse jewel mounted on the balance wheel and gives the balance an impulse. Following this impulse to the balance wheel impulse jewel, the weak spring (12) is free of the balance wheel and the double springs of the detent return its end to the detent's normal position, allowing pin (9) to relock the escape wheel.

This process is repeated during each total oscillation of the balance wheel. I was not given a picture of the “weak spring.” Nor have the ends of any parts given me (item 7 in Figure 4) been bent to allow the weak spring (item 12, Figure 4) to unlock the escape wheel.
From the detent parts available in the Van Hoesen estate, there are not enough of them to assemble a single Model 21 detent. In fact, none of the parts I have been offered are in finished condition. Instead, I have been given several jigs used for machining the items and each with a part mounted on it. As will be seen in these photographs, this series of parts shows various steps in the machining process. Most of the items I have been given are of part 7 of the detent. This leads to the belief that most items from the estate were discards, or remained following the assembly of the needed detents. Some show machining defects. However, they certainly add proof that the Hamilton detents were mass-produced in the Memphis, TN, jewelry store by Van Hoesen.

Figure 5 shows the jig for making part 7, in Figure 4, of the detent and a series of the part in various stages of manufacture. Note that the top end of the part must yet be machined away, that end bent to shape, and a pin added before use in the detent.

A group of part 7s is shown in Figure 6. None of these have the double spring machined into the body, as shown in part 7, Figure 4. Nor have the bottom ends been machined away so the part can be bent to final shape and the pin added as shown in part 7, Figure 4.

It is a certainty that many more jigs were required for machining the above parts than the ones shown. Van Hoesen loved jigs and typically made jigs with which to make jigs.

Figure 7 shows two jigs and the making of part 13. Note the pins centering the part on the jig and the simplicity of the tapered pin locking the part on the top of the jig. Obviously, there were other jigs used before these parts ever ended up as shown.

The second jig had pins through the part and sticking out of the bottom. These have been pushed into pieces of soft pith so the jig will stand up.
Figure 8 shows Van Hoesen milling Hamilton detent parts on a machine in the second floor of the A. Graves & Steuwer building in Memphis, TN, during World War II. The blueprint on the wall is from Hamilton.

From the large number of detent parts being examined by Van Hoesen in Figure 9, it is obvious that he did in fact mass-produce the required detents that Hamilton thought could not be done.

In Figure 9 Van Hoesen appears to be sorting through a huge pile of parts, most of which appear to be part 7 of the Hamilton detent. I cannot identify the parts to the left of his loupes. Nor do I know the use of the two rods in the foreground.

In his book, Time for America, Don Sauers states, “Hamilton responded by supplying chronometers in quantities that dazzled the defense establishments. In speaking of this achievement after the war, Captain H. T. Chase of the Bureau of Ships said, ‘Hamilton’s delivery of more than 9,000 instruments before VE day (11,223 during the war) was nothing short of a miracle.’”

Of course, Hamilton deserves much credit for the design of the chronometer and its production. However, it was V. E. Van Hoesen whose work in Memphis, TN, allowed them to succeed.

Ultimately, the Van Hoesen story is one that shows the tremendous impact that a single, expertly skilled craftsman working unselfishly behind the scenes can have. Had he not been able to mass-produce the critically needed detents, Hamilton could not have fulfilled its contract, and countless ships would not have had a chronometer with which to find their way at sea. This could have been a disaster for the war effort.
Figure 9. Van Hoesen examining Hamilton Model 21 detent parts under a microscope. Note the large number of parts on the tabletop.

Acknowledgments
I thank the NAWCC for the letter that was published in the Bulletin, and Patti Hobbs and John Huber for the information and parts they supplied, which made this article possible. Hopefully, this will lay to rest the incorrect history of the manufacture of the Hamilton Model 21 and gain for Van Hoesen, now deceased, the credit he has long been denied.

About the Author
William R. Smith began life as a watchmaker at age 14 and worked at the bench for many years.

At the beginning of World War II, he enlisted in the Air Corps and ended up in an aircraft instrument shop in New Guinea. There, he was awarded the Legion of Merit by General MacArthur for having designed and built 40 pieces of test equipment that got instrument-grounded aircraft back into the air.

Following the war, he obtained a degree in mechanical engineering at the University of Tennessee in Knoxville and spent his working life at the three Oak Ridge, TN, atomic energy plants in the fields of high-energy physics and technical writing.

Before retirement, he began designing ornamental skeleton clocks, building them, and documenting the steps in books so that others could build them. To date, he has written eight such books, has produced five workshop videos, written six books of poetry, and is at work on his sixteenth book. He has a BS degree in mechanical engineering, is an NAWCC Fellow, a Fellow in The British Horological Institute, a Certified Master Clockmaker, a Certified Master Watchmaker, and a Certified Master Electronic Watchmaker. In the year 2000, he was awarded the Metal Working Craftsman of the Year by the Joe Martin Excellence in Craftsmanship Foundation. He resides with his wife Judy in Powell, TN, a little town on the northern city limit of Knoxville.