

taken to swaging machines. Then it would be formed into a round bar and would be put into smaller and smaller round bars. Finally the tungsten bar would swage it down to smaller and smaller diameters and eventually it would be pulled through a diamond die that will finally be made into spiral filaments in light globes. The press leaked water profusely and standard equipment around the press was boots, and a bucket and mop. One bar pushed from the side and one bar pushed from the top. We did not use the one from the side

It was this old leaky press that we could use if we only had some equipment to use in it.

I had been thinking about what combinations of elements might be used to make diamond. Because diamond itself is a form of carbon, I assumed that carbon in some form might be needed to bring about the transformation to diamond. I was very frustrated because there was no way to try out some of my ideas. But I couldn't do anything until we had some equipment. I started thinking about equipment to use in the old press.

General Electric had a very good machine shop. But I did not have a shop order. Both Strong and Bundy had shop orders. I was quite well equipped to do design work because I had had ^{one} two years of drafting in high school, and ^{two} one year of drafting at Weber College. I drew up ~~some~~ preliminary drawings of what later came to be called "The Belt".

space
I took some of these drawings and showed them to Dr. Strong. His reaction: "It won't work. It's no damned good." Well, that should have stopped me. But it didn't. Somehow I had to get my ^{press design} idea built in hardened steel. I knew that sometimes the shop would make up projects for the scientists in their spare time.

I was quite well acquainted with one of the shop mechanics named Carl Link. I went to him and he agreed to build it in his spare time. If he could have worked on it full time it would only have taken a month, but in his spare time it took about six months. But I wasn't complaining. I now had something to experiment with.

My equipment, which came to be called "The belt apparatus, had some unique features, even in steel. For instance, in addition to getting substantial pressure, I brought heating elements into the sample through the two pistons, one on the top, and one on the bottom. The big press, still ^{not delivered} to be ordered, had no planned provision as yet for heating.

this heating idea was very effective
Unfortunately, the pressures I could generate in the hardened steel "Belt" were not high enough to make diamond. I needed to have the main components formed out of tungsten carbide. This however involved getting permission ^{from management} to buy the expensive tungsten carbide, ~~ordered through the management~~. They refused to order the carbide.

My former boss of the Chemistry Department, Dr. Herman Liebhavsky, held occasional seminars for his group. I knew that because I had previously been in the Chemistry group. So I went to him and told him that I had designed some high pressure

equipment that the group might be interested in, and would he be interested in letting me give a seminar?

He was agreeable to the idea. When I gave my talk ^{it} generated a lot of interest. Dr. Liebavsky was so impressed with the idea, he went to the Vice President in charge of Research, Dr. Chaunsey Guy Suits, and said he thought the idea deserved ordering the tungsten for the important parts. If the lab had refused to order the tungsten carbide for my press they may never have made diamonds.

This took another six months approximately, but when the necessary parts were made up of carbide and delivered, the result was, ~~to me,~~ beautiful. And at last I had something in which to experiment. *that the "belt" as it was called, then we were able to obtain the pressures & temperatures we needed*

There was one thing that was a thorn in my side from the time the belt was delivered, until the end of the project. As soon as one of the scientists saw the finished product, he started copying "the belt" which he called "a collar". Each change in his design brought his design closer to the Belt. When other members of the team would tell him it looked like Hall's Belt, he would say, "but I used these ideas for a different purpose!" This was not straightened out until just before G.E. revealed the successful diamond story to the world, and the patents were being written up for application to the U.S. Patent Department, because, when ~~the~~ ^{are} patents ^{are} written, it was very important to know exactly how, when, where and who invented the apparatus.

while still working with the hardened steel belt

We formed some fixtures to push the belt components together. Then starting from the outer rings, we would consecutively work from the outside until the final tungsten carbide die would be pushed into place. That takes care of the piston assembly. There needs to be two of those. Then there needs to be the inner tungsten carbide die.

Figure 1 through 7 is a schematic view of all of the components that need to be assembled.