

It's Only a



A Tradesman's Story of Inventing the Taco, Inc. "*freedom*FLANGES"
Circulator Flanges and Valves that Would Succeed in Changing an Industry.

By John W. Rocheleau



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Introduction

This is my story of following a dream no matter the cost, or the size of obstacles in my way, or chance of failure.

I've been an HVAC (heating, ventilating, air conditioning) tradesman for 33 years and set out to build a new career path after 8 years as a contractor. My desire to succeed as an independent inventor was as strong as my desire to exit the trade, leaving behind perpetual sooty and oily hands and Middle-of-the-night emergency service calls in winter. I needed to drive myself past the dead end street that I saw myself on, so I took a chance on an idea for a simple tool invention that I thought would take me there.

With no advance planning whatsoever, I embraced all of the inherent challenges with inventing that came my way since 1996, and have not let go even to this day in 2014.

In 1998 I invented the Taco, Inc. "Freedom Flange" circulator flanges and isolation flange designs that today are standards in my industry.

But not all went well. Therefore, my need to write about the grand experience of living a life as a dreamer and a doer became greater with time and events. While Parts I & II of "It's Only A Flange!" began as Lessons In Invention Development, their title changed to better fit my much larger story. That said, Part III fills in between the lines in "Lessons..." and goes beyond what anyone might expect to experience while seeking a new career path.

Part I – Tools

Inventing is a precarious process, to say the least, but it can also be an educational experience of a lifetime. For me, the invention development process began with a problem and the thought that its solution lay with one tool design. I had had no previous experience with inventing and was blind to the realities of the journey that awaited me. Thirty-five tool, flange, and valve designs later, I had learned about casting processes, machining, heat treating, plating, and the ritual intricacies of the legal realm – more than I ever thought I wanted to know. Thirty designs failed to gain acceptance. Five succeeded.

I had been in the heating trade for 17 years, the last 10 as a less-than-satisfied contractor. I often installed hot water circulator flanges,

but this extremely simple flange design was ridiculously difficult to install (the picture on the front page exemplifies a heating system that utilizes many of these flanges). One day while installing a multi-zone system that required 20 of these troublesome flanges, a novel idea sprang into my head, uncoiling no doubt from the considerable tension I was under. I recalled a recent experience watching another contractor install a flange. He inserted two screwdrivers through as many bolt holes in the flange, and, positioning the handle end of a hammer between them, rotated them clockwise. Lacking the leverage that it required for him to tighten the flange, the force he exerted caused his hand to slip and be sliced open by an adjacent electrical enclosure. We were both used to this sort of environment and its hazards, but it was the memory of his method, and his blood, that stuck in my mind. While attempting to assemble the 20 flanges to copper adapters with a pipe wrench and adjustable wrench—the traditional method—it occurred to me how easily a simple tool could be fashioned that would incorporate elements similar to his



Figure 1: The leading hot water circulator with quasi-elliptical flanges with no gripping surface.

screwdriver and hammer method. Only my design would prove to be safer, more effective, and more efficient.

The next morning I looked in the yellow pages for a patent lawyer. We scheduled a consultation at which time I disclosed my idea. He suggested I seek the assistance of a pattern maker to begin the process of making a sand casting prototype. "What's a pattern-maker?" I asked. The lawyer explained, and I remembered that my musician friend, David, whom I hadn't seen in 10 years, was a pattern maker. Luckily, I was able to track him down.

I called David and his first words to me were, "I'm amazed you're calling me. Just ten minutes ago I thought of you for no obvious reason." How mysterious, but I believed it was a good omen. Soon we met and explored a couple of design options. With surprising efficiency he scratched out drawings almost as fast as I conveyed my ideas to him. In only a week, I had a finished bronze prototype for just \$75. Because we were friends David was willing to accommodate my request for a rushed prototype even though he was in the midst of designing all of the door handles (250) for Bill Gates' new house.

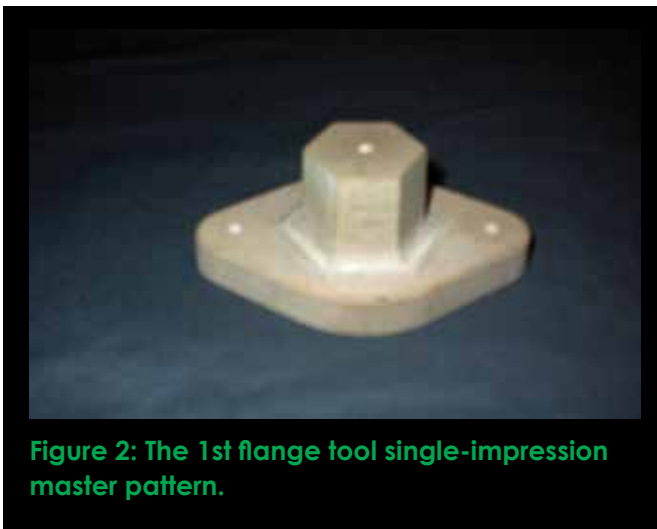


Figure 2: The 1st flange tool single-impresion master pattern.

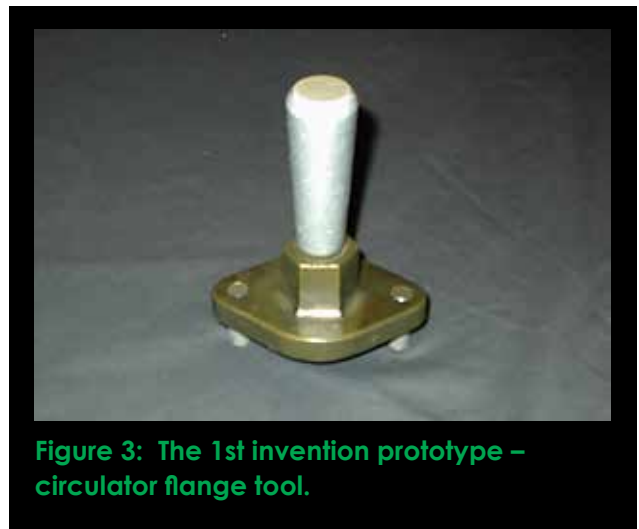


Figure 3: The 1st invention prototype - circulator flange tool.

To make certain that I was the first to invent this new device, I paid for a prior art search of previously issued patents. The United States Patent and Trademark Office has issued over 6 million patents, so focusing the search on a category of low-tech hand tools relevant to mine seemed formidable. Luckily the search produced no similar designs, so I applied for a utility patent and the trademark, "Flange-Tite".

Installing flanges epitomized my frustration with the trade, in general, in a way that challenged me to make a change. I needed a change, as I feared I might soon lose the ability to get out of the rut I was in, and like most naive inventors, I dreamed that riches were inevitable from my invention. I began to contemplate that inventing might be my new calling, so I justified spending an ever-increasing amount of time on the tool project and less and less on the heating business.

Excitedly, I began generating the interest of others in the trade. I soon learned that many tradesmen shared my view of the need to make flange installations easier. Some had created makeshift tools, but none were like mine. Most of the opinions of those who saw the invention were encouraging, but some were not. In retrospect, I seemed to give more weight to the positive comments and too quickly dismissed the negative ones. "How could they possibly know more about this than I?" I thought whenever I encountered a naysayer. As time went by I would eventually come to realize how important others' opinions were in the development process, and the need to heed all opinions is essential.

The reaction to the innovative tool design by the president of a local supply house was very encouraging; he liked it enough to offer free booth space at tradeshow. I thought if the head of a major wholesaler approved of this design then it had to be a winner, and I took tremendous risk investing more money than I had by running up credit cards. I rationalized funding the first production run with borrowed money: It takes money to make money, I thought. And I would have enough "product" in inventory to fill all the orders I would receive at the tradeshow.



As it turned out I didn't sell a single tool set (3 integral components) at the first showing, but sold seven at the second one. The kit wasn't getting the consistent reception I had hoped it would, and I needed to know why. I prepared a questionnaire to determine what customers thought of the product, and other aspects relating to their role in the trade. To justify their participation, I offered a free T-shirt in exchange for a completed questionnaire. The information I received was insightful and ample enough to bolster my creativity. In short, the tool kit needed reworking.

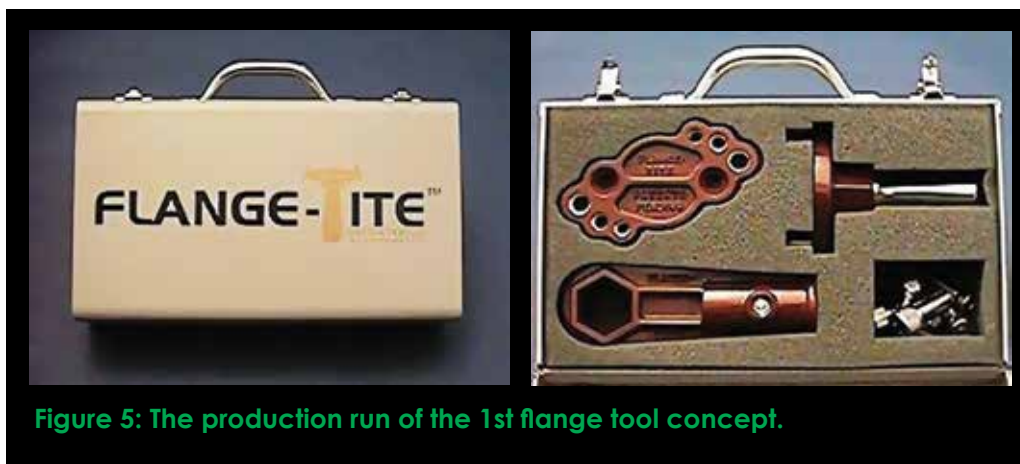


Figure 5: The production run of the 1st flange tool concept.



Figure 6: The tee shirt that I gave to trades show attendees in exchange for them filling out my questionnaire.

A few weeks later, and with David's help, the first versa-turn® ratchet system prototypes were created. I was pleased with the expediency with which this new design had come together. It was a real boon to the project that David and I worked so well together. It would come to pass that prototypes were always designed and built very quickly and efficiently.



Figure 7: The 1st production run of the versa-turn ratcheting tool kit – driven by a Ridgid 12R threading diestock ratchet.

Caught up in the velocity of the moment, I risked the last money available to me on another production run. Like a gambler, I justified my compulsion with the affirmation that, surely, the payoff would come soon. But I was developing a high quality product that I was certain would be irresistible. There seemed to be no time for heating contracting—it became a distraction—so I gave up the business, officially, even sent a form letter announcing this new reality to my customers. Nothing in heating had challenged me like this new endeavor, therefore I was committed to staying the course with inventing, I willingly admit, in an unbridled fashion.

I garnered the interest of a Manufacturers' Representatives (Rep) agency that specialized in the sales of tools and was given table space on the upcoming regional tradeshow circuit. I became so focused on demonstrating the tools, show after show that I failed to see the Rep's reaction to the lackluster sales. I concentrated more on suggestions for improvements, and I assumed we both knew it would take time before the product caught on. However, because of continued dismal showings I lost my first Rep and gained a bruised ego.

I remember being scared that I was out of money and had no heating work. Ironically, the mother of my college physics professor called me to service the heating system in a house she

was trying to sell. Naturally, I took the work. Having completed the service call, conversation turned to the goings-on in our lives. She asked what I had been up to, and not wanting to forgo an opportunity to show her my inventions, I said, "I'll show you!" I demonstrated the tools I had in my truck, and she accused me of being "a genius!" Her enthusiasm resonated through her words. She asked me when I was going public, and I told her "I was going private." "How much do you need?" she asked. I said I would get back to her if she were really interested.



She was. A few days later I called and told her I needed \$15,000.

"Alright", she said. "Come over, I'll have the check ready for you."

Figure 8: My "Angel", Mary Louise Sinon-Sayer – the great, great, great granddaughter of Jacob Wiss, Founder of Wiss Shears Co., in Newark, NJ.

As excited as a miner who discovers a new vein of gold, I anxiously made the trip across town to cash in on my find. But when I saw the amount of the check, \$25,000, I thought she had made an error. "You'll need more than fifteen", she said. "I know how these things are; they always cost more than you'd expect." There's a name for people like Mary—Angel Investor. I could hardly believe my good fortune. In retrospect, it's a good thing (for me) that we didn't know how much money we would come to spend. Had we known, surely she never would have written that first check, and my inventing days would have ended then.

Mary's great, great, great grandfather had started the Wiss Shears Company in 1842, which stayed in the family until 1988. Jacob Wiss, a Swiss watchmaker by trade, started making shears with a German shepherd. Yes, a dog. As the dog walked along in a treadmill, like you've seen in hamster cages only much larger, a connecting drive belt turned a polishing stone. Jacob used this method for a year then, doubled production in his 2nd year by adding a second dog. Perhaps he dangled a steak in front of the dogs as an incentive - probably not. My newly formed business reminded Mary of her ancestor's early beginnings; she saw potential in my creations and thought I would ultimately succeed. For her, funding my project was a fitting tribute to Jacob.

I considered my luck. I had found an Angel without even looking. It seemed to make sense that this inventing business was my calling. Everything just fell into place at the crucial moments.

With my recent cash infusion I was able to integrate suggestions for new designs. I made radical changes to the tools and developed several for new applications. Going off on a tangent is so typical of inventors, a pattern I was unaware of then. I suppose I used the shotgun approach to inventing hoping to “hit” something.

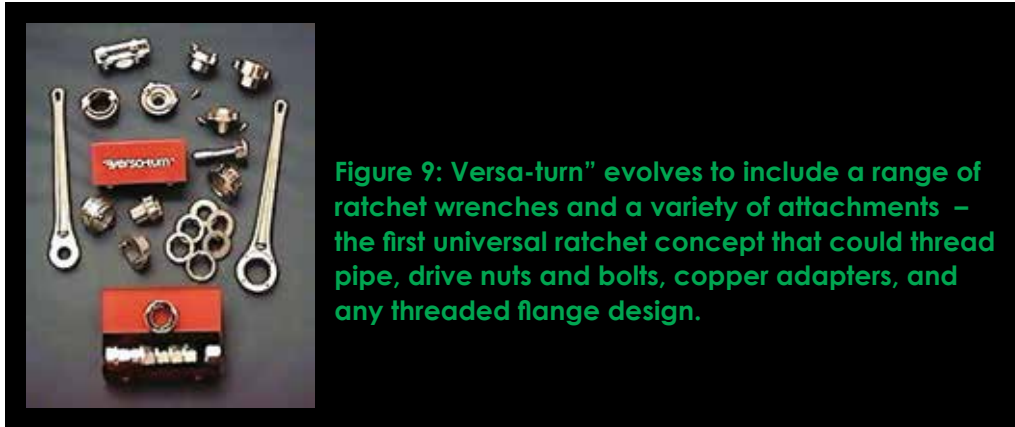


Figure 9: Versa-turn” evolves to include a range of ratchet wrenches and a variety of attachments – the first universal ratchet concept that could thread pipe, drive nuts and bolts, copper adapters, and any threaded flange design.

I scurried from design table to Rep agency and tradeshow. Only now I had a set of “universal” ratchet wrenches and attachments. A pattern maker, Andrew J. Cutney, helped design these unique tools. I also began to establish important contacts with some wealthy and influential players in the industry who offered their opinions and support. Some talked of investing money, mostly through innuendo, but at the last minute reneged. Maybe they knew something I didn’t. They all seemed to think I was doing the right thing for the trade, so I continued to work diligently to come up with what seemed like saleable products. Many were profound and useful. A litany of people made money from them—pattern makers, machinists, foundries, heat-treating companies... a list of 42 different individuals and businesses. The list wouldn’t be complete, though, without including the lawyers.

By now I had two intellectual property lawyers and had gone through a number of business lawyers before finding one that showed a little mercy while tallying his billable hours. I had spent the equivalent of a year’s salary paying all their fees. Everyone was making money except my investor and me. I tried to be positive about it – at least I was getting the hang of product development, and surely something would come of it.

Interestingly enough, I knew little about the resources available to inventors. I did contact the Inventors Assistance Program at Franklin Pierce Law Center (the top intellectual property school in the country) but my phone calls were never returned. It's an ironic coincidence that I lived only four blocks from the Law Center, the monthly meeting place of New Hampshire Inventors Association, and 3 blocks from the Academy of Applied Science. I was oblivious to their presence and that they were so close by. The Academy's mission is to create a greater awareness for 'invention, innovation and science' and its founder, Dr. Robert Rines, also the cofounder of the Law Center, is married to the publisher of Inventor's Digest magazine, a publication I had never seen. In a sense, I was inventing my invention development process as I went along. I assumed that I had to learn this business on my own, not knowing there was help out there.



Figure 10: Concord, NH's own Franklin Pierce Law Center, among the top intellectual property law schools in the world – the meeting place of New Hampshire Inventors Association.



Figure 11: In addition to FPLC, the Academy of Applied Science was founded by Dr. Robert Rines for the purpose of involving children in science and invention and innovation.

The fact that I wasn't aware of the local groups comes as no surprise to me now. Independent inventor organizations rarely advertise as a means of creating awareness for their existence—they're simply under-funded, as I've come to learn. I did create a website, hoping the internet would facilitate sales of the tools, but never considered to search for inventor organizations that could offer help with the development process, online. Since then I've learned

that the internet is a great source of information for inventors, and a basic search of the web can produce invaluable information that will make an inventor's development process much easier. It makes for sad commentary that independent inventors are more likely to be exposed to advertising by scam companies than by legitimate organizations. Shady "invention marketing firms" are defrauding independent inventors to the sum of over a hundred million dollars a year, preying on their naivety and emotions, thus contributing to the 98 percentile that fail to achieve significant success. Government agencies such as the Small Business Administration, and the Small Business Development Centers, lack funding enough to deal with starry-eyed inventors. Given the available public and private resources, inventing is, basically, a series of lessons that each inventor must discover then master on his/her own.

My inventing may have been on-the-job-training for me, but having a lot of the right contacts helped me churn out new prototypes rather quickly—one took only a day from first thought to machined casting. Actually, the inventing part was the easiest, and the most fun. I suppose my investor began to look at it differently, though. She was beginning to wonder when the inventory would be sold and the cash would flow in our direction.

Just when our sales situation seemed insurmountable we were given cause for renewed hope when the tools appealed to a Rep with a major presence in the industry. They bought 110 Flange-Tite®, FT II flange tools. Securing representation in the largest territory in the country, the Northeast, was a milestone for us. It seemed as though our investment would begin to pay off after all - too bad that belief was short lived. A few months after the initial sale to the Rep I got a call from them saying it would take more time to create the demand for our tools than they were willing to invest – end of story.



Figure 12: FLANGE-TITE becomes one with itself. Gone is the kit mentality – turns out they make great bookends!



Figure 13: The final flange tool design .



Figure 14: This tool also could drive a 3/4" automotive socket set for use with water heater anode rod removal and installation.

I began to see the light regarding distribution. A product may be a good one in many respects but if it fails to answer the questions surrounding the four "Ps" of marketing (product, price, place and promotion) it won't attain a profitable position in the marketplace. The "P" we were not yet in control of was price. First, our tools were too costly to produce, and distribution costs also had to be factored in making the retail price greater than the end-user was willing to pay. Also, Reps don't want products that take a lot of effort to establish a profitable market share, especially if sales are expected to peak only briefly, then drop off sharply and remain

low—my tools fell into this category, unbeknownst to me. My inventions were too task specific and cheaper alternatives were readily available. Reps do want commodities that sell easily and have ongoing sales potential—products that “sell themselves.” They sell tools only if there is an established demand for them, as with pipe wrenches and cutters. Even then, the profit margins on tools of that nature are slim.

I was now faced with the choice to do the sales work myself or give up. So I tried a grassroots approach. I literally knocked on the doors of contractors with a salesman from the local supply house. I sold every tool the supply house had purchased from me in this way, but at a reduced price so they wouldn't have the burdensome task of selling them and I wouldn't have to return them to inventory. I also attempted to sell tools at supply house “counter-day” promotions, often to many of my competitors in the trade – talk about barriers to entry. These sales methods are designed to contribute, in part, to two more “Ps,” promotion and place, but alone do not guarantee success for the product.

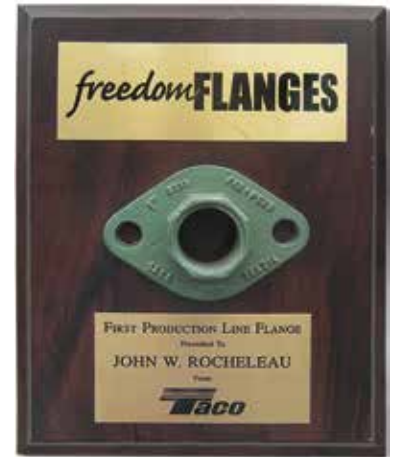
So I gave up on the drudgery of going door-to-door and months later teamed up with Rep number three with an all new ratcheting flange driver. Primarily a manufacturer, this firm was new at promoting others' products, they liked mine but they took a cautious approach toward investing their limited time on them. So I did all of the necessary work at the next tradeshow with them until they, too, decided the tools didn't fit their niche. Really, the tools just weren't selling well. As it turned out this would be my last opportunity for representation. Had I come all this way, learning so much, just to fail drastically? I had spent well over \$100,000, but lack of funding wasn't my problem. What, then, had gone wrong? I had become a very good coordinator of people who had the skills to create what I thought I needed to succeed. I had so many ideas that I just couldn't believe none of them would end up in the marketplace. But I wasn't finished; I had a lot more to learn.

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A Tradesman's Story of Inventing the Taco, Inc. "*freedom*FLANGES"
Circulator Flanges and Valves that Would Succeed in Changing an Industry, Though Not the Way He Intended.

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Part II – Industry Standards

The thought entered my mind that perhaps price, place, and promotion weren't the only lessons to master. But I did redesign the product, too, in search of the right equation. Still, all of my attempts had failed. I had been blinded by my own dogged perseverance, causing me to fail the most crucial lesson of all. But what could that lesson be? I strained to find the answer, but it seemed time had run out. Then it was confirmed: offers for additional financial backing from my investor, representation, and free trade shows ceased, and with them my excitement and enthusiasm. I'd all but given up and others already had. What consumed me these days was how to explain to my friends, family and readers of my resume that I had lost six figures developing "pie-in-the-sky" inventions. I became seriously discouraged and as stressed as I'd ever been. I got in the habit of bringing a bath towel to bed with me so when I awoke during most nights, drenched in a cold sweat, I would have something to dry off with. Those around me sensed disaster and distanced themselves from me.

Early into the invention project I ended a long-term relationship with my girlfriend who cringed at the amount of money I was spending and constantly reminded me of it. I couldn't tolerate her incessantly nagging me. She really thought I wasn't in my right mind. Even my friends lost patience with the never-ending saga. This inventing business was exacting a heavy toll, and I couldn't decide which was worse, flange installing or my invention project—"the disease or the cure."

Haunted by the memory of all the rejections during the last year and a half, I strained to find meaning at the last tradeshow as I demonstrated the last flange tool design. I was asked the same question for the nth time by the nth tradesman—"why do they make the flanges like that?" We agreed that the flange design was questionable, but I sensed that he didn't think my tool concepts were the solution to the problem. Then I had a flash of insight, more importantly, a renewed perspective. My attention centered on the initial design options David and I had discussed at our first meeting. One design was of a flange with a hexagonal-shaped tightening surface. This was the turning point where I realized that I had veered down the wrong path by developing the flange tool of the same shape. A new flange design would offer the Reps and wholesalers a new utility that I was sure they could sell, as it would solve the installation problem for the tradesmen, and allow them to pass on the cost to their customer. My hope was rejuvenated.

I envisioned becoming successful with the first new circulator flange in as many as fifty years. Only now a shadow loomed over it, threatening it in its infancy. My investor surprised me by saying "No more, John!" She had often exclaimed, "Your inventions are all tinker toys!" To her I had also become the boy who cried wolf. I felt this time was different, just as in the tale of the boy and the wolf. Truthfully, I think she knew it, too. She was just being firm in her opposition to spend more money, merely out of principle.

Mary had considered using her 100-acre farm as collateral against a loan to my business early on. She had been ready to bet the farm—literally—but now was far from that liberal way of thinking. I felt hopeless, knowing she had already spent the money from the sale of her house

where I had made the original service call roughly a year earlier. She had stayed with me for a year and 30 failed designs, I couldn't expect anything more. I could have begged her, but I had never asked her for money – she had just always known when to contribute in this way. And what if this idea failed too? Mary was 78 then, and her best friend since college had nicknamed her "CW", short for Crazy Woman, many years earlier. Exactly why I'm not certain, but it seems she took a risk in the past, and lost, with some sort of refrigeration business, and I didn't want to give her friend more fodder. Nevertheless, I persisted in explaining the significance of this latest discovery to her from as many angles as seemed relevant. I realized the simplest solutions often are the best ones. And I had to convince her that this flange was my best one. Thankfully, I found several people in the industry to corroborate my belief that I really had invented a "winner" this time around. It was then that I knew I was right. Finally, she believed the flange was a good idea and invested even more money.



Figure 14: Old industry-standard cast iron flange.

I met with David once again and revisited the sketch of the tool/flange that we had made years earlier. We modified the design to include an octagon shaped nut that could be easily gripped by an ordinary wrench. The only significant difference between the flange tool and the new flange was that the tool had a hexagonal nut. It was so simple, like a Post It Note. The prior art suggested that nobody had done this with a circulator flange before, so I applied for as many design and utility patents as my lawyer and I could think of. At that time I conjured up nearly 70 ideas for a range of flange designs.



Figure 15: The first of many FLANGE-TITE flange designs. An octagon grip surface and a stronger iron means that no special tools are needed for installation – any adjustable or pipe wrench can easily grip the “wrench boss”.



Figure 16: The 1st flange tool pattern sits compared to the 1st flange pattern with 4 different sizes – 3/4” – 1-1/2” female pipe thread.

I completed development on four of the designs in a month. It took just a few phone calls, and in an instant I was back on track. Once again the president of the local supply house offered his advice: ‘Call the executive vice president of marketing at a Rep firm, Emerson-Swan,



Inc., in Massachusetts and ask him what he thinks about the flange.’ This firm represented a Rhode Island company, Taco, Inc., a manufacturer of “hydronic” components including circulators and flanges. Taco was the market leader in the region and their products enjoyed high brand loyalty. What I soon learned would delight and amaze me.

Figure 17: Taco, Inc. headquarters in Cranston, RI.

I called the VP, and we met two days later in the waiting room of a Mercedes dealership while his car was being serviced. He seemed very impressed with the flanges I showed him, though I had the feeling there was something he wasn't telling me—he seemed too interested. These were such simple low-tech sand castings. I sort of accepted his energy, rationalizing that it was typical to see a person's enthusiasm when they saw my inventions for the first time. But I decided to do a little digging and I am glad I did. I learned that Taco was losing money on their flanges, and were factoring that loss into the sell-price of their circulators. The negative contribution to profit stemmed from increased competition, resulting in the loss of 30% of their market share for flanges. This explained the VP's immediate enthusiasm for a new flange design.

A week had passed, and he stayed true to his word that he would arrange a meeting with Taco. I met with Taco's VP of marketing and a handful of managers at their plant. As expected, their interest level was high, and negotiations began. I was now in for an education in the art of negotiating. The pursuit of success had created immense strife in my personal life, but the pursuit of “a deal” dwarfed my earlier trials.

Negotiations weren't going the way I had naively hoped, so I decided to shop the flange around, realizing that if Taco was interested in the flanges then their competitors might be, too. They were. I discovered that they all had problems with their flanges. This seemed incredulous. It wasn't long before I was on a plane to California to meet with executives from the largest pump manufacturer in the world, Grundfos Pumps Corp., all expenses paid. But Taco sold the greatest number of this style of threaded circulator flange in the world, over a million a year. Knowing this helped me determine the total market size, and I seriously considered supplying the market with flanges, myself. I made contacts with an array of other manufacturers, Reps and potential investors. I lined up production agreements in case negotiations with the two primary companies fell through. Nonetheless, I pursued them vigorously.

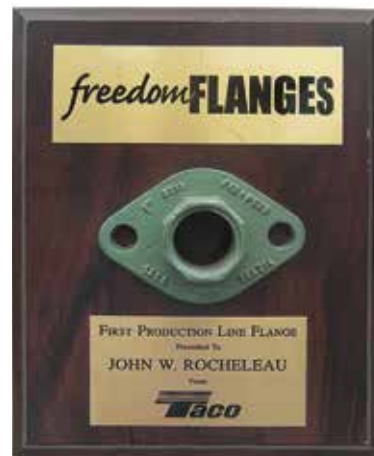
The last thing Taco needed was yet another company competing against them. Therefore, they had the most to lose without my design, and the most to gain with it. They were aware that if they could regain their lost market share with a patent pending flange, a “better mousetrap”, then a deal with me made a lot of sense. The fact that they produced so many flanges ensured the possibility of significant royalties for my investor and me, and I was determined to pay her back. So six months later I signed a license agreement with Taco on two flange designs, but not before asking for help one last time from the supply house president, this time with negotiations; I needed a mediator. Taco and I had reached an impasse in negotiations, but once the president agreed to mediate it took just 3 weeks to settle the deal, and the first check, \$35,000, was signed to my company.

Since closing the deal, Taco has replaced their old standard with my designs. The “freedom Flanges,” as they've named them, are on the market, and the positive response has been nothing short of a consensus. It appears that a new standard has been created. The most often asked question was ‘why didn't they do “this” years ago?’ I wish I could collect royalties on my answer to that question. Whenever I hear that question I am reminded of an inspirational statement on a poster in my insurance agent's office: “What we can easily see is only a small percentage of what is possible. Imagination is having the vision to see what is just below the surface; to picture that which is essential, but invisible to the eye.” This flange solution was a glaring example



Figure 18: Grundfos Pumps Corp.' trade dress on my new circulator flange design.

of a concept so simple that no one before me considered looking for it. The torturous route that I had taken may have been less grueling and more direct if I had given equal attention to the flange option right from the beginning. Hindsight is so clear. Is it not?



Eight months following completion of the first deal, Taco and I signed a second agreement on three valve inventions. Recently we began discussions on my latest invention ideas.



Figure 23: The flange and valve patterns that produced the prototypes (figure 21).



Figure 24: The valves I invented replace this conglomeration of fittings, gate valves and problematic flanges.

Seeking to create tools based on a flange design reminds me of the 3M Company's search for a new adhesive. When their engineer pasted a sticky substance on squares of paper, to keep his place in his church hymnal, he had created what would become the Post-It Note; as simple an idea as my flange. Another notable inventor, Norm Larson, created 39 chemical formulas to inhibit rust before his 40th proved successful: "Water displacement, 40th attempt" in other words, WD-40®. I became successful with my 30th attempt, though no comparison can be made to the 100 million dollar a year success that WD-40 has become. It seems solutions to certain problems are often discovered before they are recognized as solutions, and it can require carrying an idea through a process of elimination before the successful discovery is made. My plan wasn't to start a one-product company—one-product companies are rarely successful. Although, failing with the tools and succeeding with the flange made it apparent that the simplest designs can often be the most successful. Moreover, I knew little about the market for flanges in the beginning of

my journey and didn't think I could compete with Taco's established North American distribution, even with a new flange design. Thankfully, I had come full circle with my journey and was a lot wiser for having taken the trip. With attainment of inventing wisdom my hair has begun to gray, but I no longer need that bath towel.



Figure 25: I wished I had invented this well-known product!

The invention development process doesn't have to be as difficult as it was for me. I should have done a lot more market research before spending so much money on patent applications,



Figure 26: These are among my best prototypes.

costly patterns and prototypes, production runs, and, generally, spinning my wheels on whimsical ideas. In a perfect world a \$10,000 market analysis in the beginning may have helped me choose the path of profit much sooner. I would have discovered there was far greater market potential for flanges than for flange tools. I estimate I might have saved \$145,000 if I had bypassed the tool approach and gone directly with the flanges and valves, my last five inventions.

Looking back at my experiences from my present perspective as president emeritus (2000) of New Hampshire Inventors Association, I've concluded that many other inventors are going through the same kind of educational process; I see mostly failure and small successes, as most inventors will have to learn by doing and aren't prepared for what it takes to succeed. Inventors need to have an awareness of the invention development process and its pitfalls. Also, they will need to possess passion and determination and, more importantly, a marketable idea. Moreover, I know the following declaration by Thomas Edison echoes in the minds of other inventors, as it does in mine: "Had I known in advance what I was in for I would not have started!" But I did start, and I finished successfully. I pushed forth with drive and creativity I didn't know I was capable of and beat the odds. 98% of inventors fail, many of them making the same predictable mistakes that I made.

It should be noted that my invention "boot camp," and my ultimate success, would not have been possible without the ongoing faith of my investor. In exchange for her risk-taking Mary will receive a ten percent return on her total investment, plus 40% of royalties from the second license agreement. Most inventors run out of money before they succeed; I would have too if not for Mary. She was not only my Angel, but my savior during my darkest hours of seemingly imminent failure. I'm very thankful that she will be repaid.

An intangible benefit to me is that I've learned more about my capabilities and limitations through this process than through any other personal challenge. In overcoming this challenge I have found the new career path I hoped to discover. I am presently in school completing a degree in business that I started in the 80s and will continue on in engineering—I'm reinvesting my royalties. Ironically, and with any luck, I've invented products for the trade that I may never need to return to as a technician.



Figure 27: The license plate on my 1973 Jeep CJ-5.

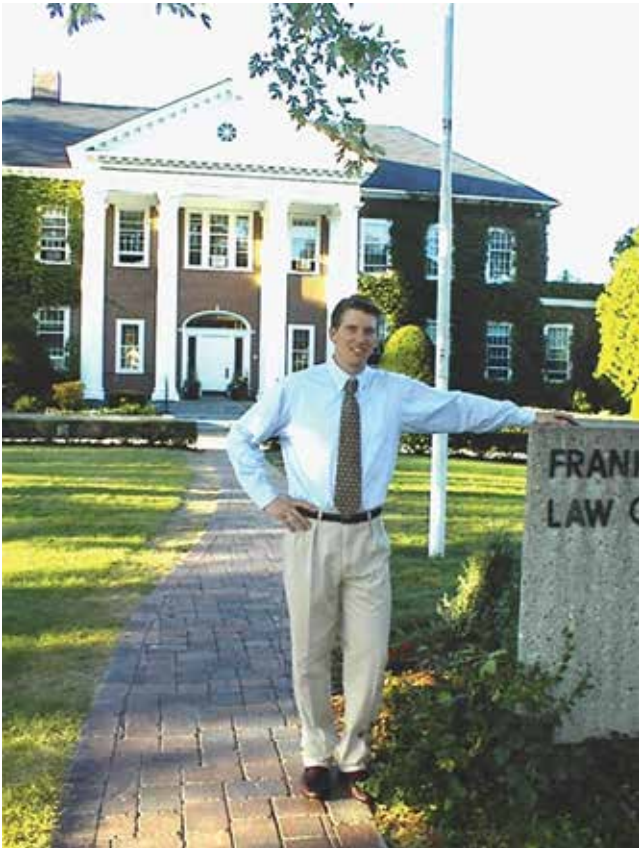


Figure 28: I became President of New Hampshire Inventors Association, which met at Franklin Pierce Law Center, after members heard me on the NHPR show, *The Exchange*, hosted by Laura Knoy. The show episode was about inventing and included me, a professor from FPLC and Joanne Hayes Rhines, wife of FPLC co-founder, Dr. Robert Rhines, and editor of *Inventor's Digest* magazine.



Figure 29: 'Standing behind my inventions' in 1999.