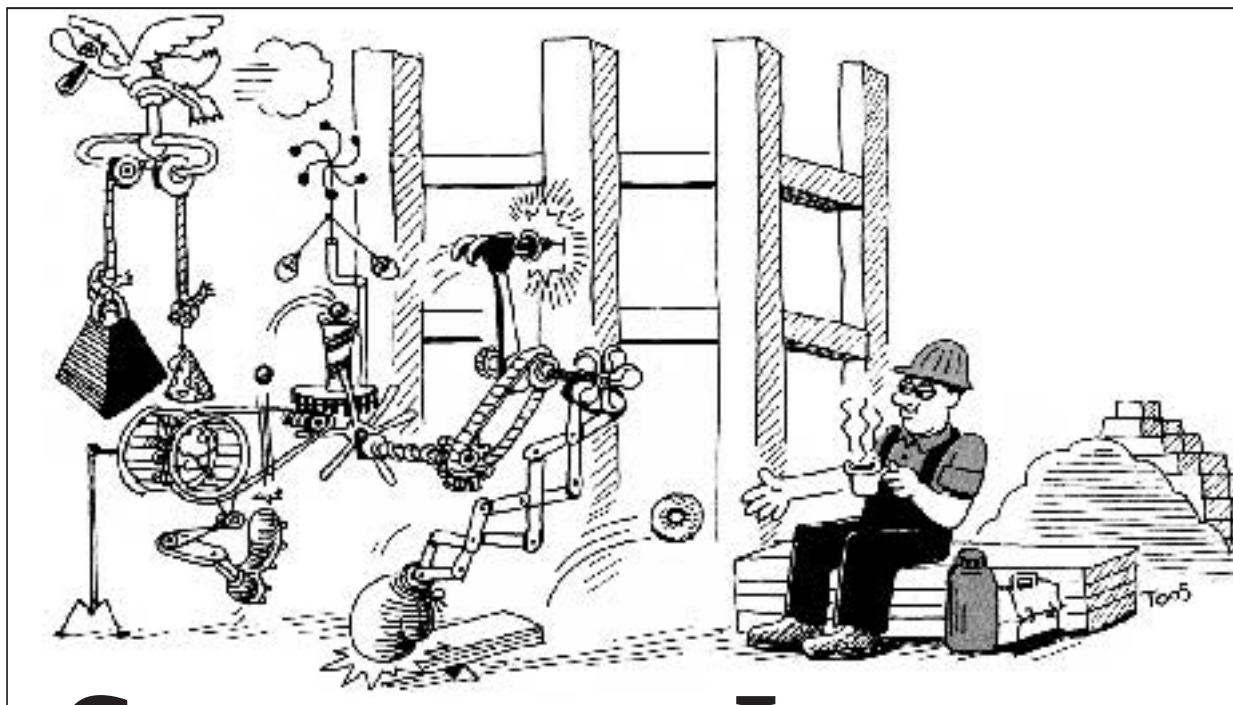




Carpenters of Invention

These four latter-day inventors show how a little inspiration and a lot of perspiration can still transform a bright idea into a marketable product.

They laughed at Edison. They laughed at Alexander Graham Bell. And when you tell the crew about the invention you've been working on, they may laugh at you. Well, you may think, we'll see who's laughing when I'm featured on the cover of *Popular Mechanics*, basking in the glory and sitting on a stack of hundred dollar bills.

Of course, not everyone makes it that far. In fact, the failures far outnumber the success stories. But many manage to get their ideas into production and make a profit, if not a fortune. The recipe for success seems to be a good idea, a little luck, and a lot of perseverance. The patience of Job and the single-mindedness of an ox also help. Here are four examples, reported by JLC staff, of builders who had an idea they believed in and the gumption to do something about it.

Want to Make a Million?

"Tell you what," the carpenter told Steve McLaughlin, "if you want to make a million bucks, here's what you do."

The carpenter was installing a wood stove in a remodeled family room. To do so, he had to erect a bulky sheet-metal wall protector between the stove and the wall. (It was either that or install the stove 3 feet out from the wall.) And when he installed the stovepipe, he had to cut a gaping hole to run the pipe through the wall to the exterior chimney. Sure, it met code, but it looked awful.

The carpenter told McLaughlin that if he could come up with an attractive, easy-to-use, safe way to install stovepipe through the wall, he'd be rich.

The idea caught McLaughlin's interest. For the next three years, he worked on and tried to market a solution. Along the way, he learned about market research, patent lawyers, venture capitalists, and business consultants.

In the end, he developed an innovative system for passing the pipe through a wall to the chimney. He calls it, simply, the "Pass-Through System." It consists of refractory lining and an adjustable steel chase that surrounds the stovepipe; refractory wall panels are used behind the stove. The system prevents heat from being transferred to combustible components, thus meeting code requirements. Best of all, the refractory panels, made of a non-combustible calcium silicate, can be installed just like dry-wall, and may be painted or wallpapered.

However, in his venture into the inventing business, coming up with the idea was the easy part. "I had no idea what I was getting into. I thought I could make money within a year."

His first step – and expense – was hiring a lawyer. Here, he got lucky. A senior partner from one of the top patent law firms on the East Coast decided to



Inventor Steve McLaughlin stands next to his "Pass-Through System," which safely carries hot flue pipes through combustible walls. A refractory lining and an adjustable steel chase surround the stovepipe; refractory panels are used behind the stove.

drop out of the rat race, and move to the coast of Maine, two miles from McLaughlin. The attorney helped him file his disclosure statement, which protected his invention while he completed the long patent process. The lawyer also helped him line up someone to conduct a patent search. The patent search is much like a title search in real estate transactions. For each patent that turned up similar to McLaughlin's (18 in all), he had to write a technical explanation why his system was not like any of these other inventions.

Once the material was gathered and the defenses written, McLaughlin sent a letter to the patent office requesting a patent.

Lucky break #2: In what often takes three years or more, the patent office

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Getting the Patent:

Hurry Up and Wait

Finding your way through the maze of patent applications, patent searches, and U.S. law is not an easy task. Most inventors who seek a patent hire a patent lawyer or patent agent to help prevent an inadvertent loss of rights. Here's an overview of the process, from the lawyer's point of view.

Patent rights derive from the U.S. Constitution and statutes enacted by Congress. Generally, a patent is a 17-year-long legal monopoly granted by the federal government to the inventor in exchange for a full public disclosure of the invention. The monopoly prevents others from making, selling, or using his invention in the United States.

Step by Step

The first step in the patent process is a preliminary search. Typically, the inventor approaches a patent lawyer, who subcontracts the search to a specialty lawyer or technical researcher. The researcher conducts an independent search of all relevant patents on record to determine if the proposed invention fulfills the basic criteria for a patent (discussed below). Depending upon the complexity of the invention, this search costs from \$300 to \$1,000. If the proposed invention has not been patented, and looks as if it could be, the patent lawyer will file a formal patent application. When this application is submitted, the Patent Office conducts its own examination to see if the invention already exists and if it fulfills basic criteria. In effect, it determines the patentability of the invention. If all goes well, a patent may be granted. The entire process can take anywhere from one to three years.

New and Useful

Patent protection is available for devices, methods, processes, compositions of matter, or for improvements of things already in existence. The standard for measuring whether an invention is patentable is whether it is "useful, new, and non-obvious" in light of all of the written and public information which was available prior to the invention. Your invention must fulfill all three of these criteria if a patent is to be granted. This is what your patent lawyer's original independent search determines, and it is what the Patent Office will determine officially as well.

Most inventions easily satisfy the "useful" requirement. The "new" requirement typically means that your invention was not identically

disclosed in a publication, offered for sale, or in public use (and therefore public knowledge) more than one year prior to the filing of the patent application.

Whether your invention is "non-obvious" — the third criterion — is a very subjective test. Essentially, an invention fails this test if at the time of invention it was obvious to one of ordinary skill in the field of the invention in view of the "prior art" that was available, world-wide, before the date of invention. To the extent that it is non-obvious, the invention is patentable. Many rejections are based upon the so-called "obviousness" of the invention.

Keep Good Records

As you work on your invention, maintain a written record of your activities. The record need not be in any special form, but it should adequately disclose the concept and making of the invention so that someone reading the record would understand the invention.

Once the invention is recorded in writing, date and sign the record and have someone else sign and date the record. That person should note that he or she has read and understood what the invention is. This could be important if you ever have to prove when you made the invention. If a witness is not available, mail the record of the invention to yourself. Leave the envelope unopened with the date stamp from the Post Office as evidence of the mailing date. A more expensive alternative is to use the Patent Office program, which receives invention disclosures, holds them in secret, and records the date of receipt.

Filing the Application

If after the preliminary independent patent search you decide to proceed, a patent application, which is a legal document, will be prepared by a qualified patent attorney or patent agent. This document will describe how your invention will be manufactured, used, or employed. This document will provide enough detail to enable another person to understand the invention without undue experimentation.

Also, the patent application will provide a series of "claims" which define the boundaries of the invention. Those claims, which are perhaps the most critical part of the patent document, should be prepared by someone experienced in patent applications.

Depending upon the complexity

of the invention, the cost of preparing and filing the patent application with the United States Patent Office will probably be between \$3,000 and \$10,000.

At this point in the process, patience is a virtue. It typically takes from two to three years from the time a patent application is filed until a patent is issued. The Patent Office will hold your application in secret throughout the process. During this time, you have no protection for your invention and anyone else can use the idea. Once you've filed, it is sometimes worthwhile to place a "patent pending" notice on the product in order to warn others and hopefully dissuade them from entering your market. So, if the idea has but a short useful life, it may not be advantageous to obtain patent protection. On the other hand, if the invention has a long lifetime, then the patent process can be of significant value.

Enforcing the Patent

Once the patent has been granted by the United States Patent and Trademark Office, the inventor has a right which he can enforce, but it is not self-enforcing. Often, licensing agreements can be arranged whereby the inventor can get a royalty income in return for rights to manufacture and market the invention. But in some instances, you must resort to patent litigation in order to enforce your patent rights. Patent litigation, however, is quite expensive and time consuming. A typical lawsuit can easily be pending in the federal district courts for two or more years and may cost you on the order of \$200,000 or \$300,000 to prosecute.

There is, however, a new type of insurance that covers the cost of litigation in the case of patent infringements. If someone infringes your patent, the insurance company will reimburse you, with certain minimums and other rules, for the cost of litigation so long as it is a legitimate patent suit.

In summary, it is important to consult a patent lawyer or patent agent soon after the invention has been fully conceived to determine whether or not it is worthwhile to seek patent protection. This early consultation may also be important in preserving foreign patent rights.

It is also important to recognize that one cannot prevent others from practicing the invention until the patent is granted. Furthermore, once a patent has been granted, it is useful, by statute, to mark the patented product with its U.S. patent number.

Gary Walpert is a senior partner with Hale and Dorr, a Boston-based general-practice law firm that handles patents, copyright, and trademark matters.

approved his pass-through system in only 19 months. "People call me a liar when I tell them how long it took me," he says.

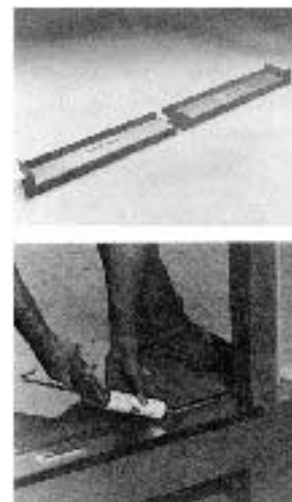
Finding capital wasn't as easy. Here, his luck ran out. "I spent a year — totally unsuccessfully — looking for venture capital. Unless you have a long track record, they don't want to talk to you." A small grant of several thousand dollars from the state of Maine helped, but not much. Still, he stuck with it. So far, the process has taken three years, and cost McLaughlin \$150,000. "I'm leveraged up to my eyeballs," he says.

Now McLaughlin is looking for a marketer to take over the entire operation. "I've come to the conclusion I don't want to be a businessman," he admits with certainty. "I don't have the disposition for it." Like the skilled carpenter who becomes a megabuilder only to one day return to his cherished trade, McLaughlin is back to tinkering.

For information, you can contact Steve McLaughlin at Furnex, Park St., West Rockport, ME 04865; 207/763-3944.

— Jason Perry

It's Cheap, It Works, It Sells



Jamsill (top), invented by Gregory Moffitt, is a seamless, molded ABS-plastic pan that installs between the rough opening and the sill. It installs quickly, is inexpensive, and Moffitt claims, stops leakage, even under sliders (bottom).

"Get the hell out of my office. You're a pain in the ass!" was the response Gregory Moffitt got when he first tried to sell his invention, "Jamsill." He's gotten the last laugh, though, because he's sold over 40,000 Jamsills since. More importantly, Moffitt explains, Jamsill, Inc., is beginning to make money. "It's starting to take care of me for a change."

Here's how he got started. Like many builders along the rainy Pacific Coast, Moffitt used to install metal flashing under door sills to prevent water leakage. But the doors often leaked anyway. So in 1983, Moffitt and his friend Glenn Brown began working on a solution. By year's end they had made and patented Jamsill — a seamless, molded, ABS-plastic pan that installs between the rough opening and the sill (see photo). It stops leakage, "even under sliders," claims Moffitt.

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He has yet to receive even a single report of failure.

But things did not start out so well. Moffitt's first failed sales call was followed by many other "no thank yous." Things began looking up only when Moffitt took his pitch directly to builders, first at a regional conference, then at the 1984 NAHB show. "Ninety percent of the builders who see Jamsill really like it," he explains. "It's cheap, it installs in 30 seconds, and it works. It only costs \$15, but we've had builders tell us they'd pay ten times that to stop callbacks for leaky doors."

In the beginning, despite interest from builders, suppliers and distributors didn't bite. They told Moffitt they needed to feel an actual demand for the product before stocking it.

"So," says Moffitt, "I took the demand right to them." Whenever a builder expressed an interest in Jamsill, Moffitt found out who the builder's supplier was. Then he told the supplier about the builder. Sometimes he even had the builder call. By forging connections between interested builders and their suppliers, Moffitt slowly built a sales network. Word of the product spread. Now orders arrive fairly steadily, and Moffitt feels Jamsill is finding its market niche.

The early days of constant rejection and worry seem to be over for now. But Moffitt carries one memory from those days fondly. "We were just starting to make some sales, and who calls but that door manufacturer who'd thrown me out of his office. I remembered him right away. He didn't remember me, though, or at least he didn't act like it. But that was okay, because he was calling to ask for a price on a big order. Now he's one of my regular customers."

For more information, contact Gregory Moffitt at Jamsill, Inc., P.O. Box 485, Talent, OR 97540; 800/526-7455. — David Dobbs

This One's On the Level



Plumb-It, invented by Paul Semler, consists of a level flanked by two aluminum I-beams that ride up and down on the level's flanges. The popular 4-foot version can be expanded to 10 feet 8 inches with no play.

"It's not a living yet, but it's close." That's the way Paul Semler of Tucson, Ariz. describes "Plumb-It," the extendible level he patented in 1984. He has been manufacturing and selling it ever since. "I thought about letting my contractor's license expire last spring, but I'm not quite there yet."

It was the mid-1970s when Semler

first started thinking about a tool that would plumb rake walls, concrete forms, and a host of other house parts without "nailing a level to the least crooked 2x around." He finished his first prototype in 1983.

It consisted of a quality, 4-foot Stanley level flanked by two aluminum I-beams that rode up and down on the level's flanges. This 4-footer could be expanded to 10 feet 8 inches without any play or instability (see photo). The reaction he got from other framers was, "This is great. You can't help but make money." Semler remembers the feeling well, "When you get a reaction like that, it makes you think."

Semler sees the patent process as "the first big hurdle as far as dollars go." He was fortunate in two ways. First, he had a nest egg of "petrodollars" earned while building in Saudi Arabia for a couple of years. Second, his patent application was accepted on the first shot. "I was lucky. Mine was one of the ones that went right through." He used one patent attorney to do the search, and then switched to another whose strength was in writing patent applications. The entire process cost him about \$3,000.

His next move was to send his invention off to a large tool manufacturer. He thought he had a good shot at selling the patent rights. He looks back on his hopes for a quick profit as a bit naïve. "I know now that few tools like this are bought by big companies, because they're not mass-market items. Unfortunately, they don't tell you why they rejected it, they just send it back."

Semler persisted and dove into manufacturing and marketing "where the real hassles start." He began by getting a local aluminum window manufacturer to make his I-beam stock; he cut the voids in the webbing himself with a router in the commercial shop space behind his house. "That's one thing that has really nurtured my business — owning a shop. I couldn't have done it if I'd had to pay rent on a place."

To Semler, the manufacturing process is an opportunity to improve the product, constantly. "You are the creator of the product, and you are always focusing on the weakest link because you want it to be everything it can be. As a small entrepreneur, you can keep improving with the proceeds from new sales." Semler no longer uses an off-the-shelf level, but makes his own in 3-, 4-, 5-, and 6-foot lengths (this latter model extends to over 17 feet). He's also made substantial improvements in the feet and changed to a top-quality European vial maker last year. He still does much of the work himself.

Marketing required money, and that's not always a steady commodity. "That's the downside. It's not that you're broke, it's just that you have no cash," says Semler with dead seriousness. He has tried advertising in national magazines but adds, "It's expensive and it's hard to measure the benefit."

To date, trade shows have been his most effective tool; he spent over \$30,000 on them in 1989 including a booth at NAHB in Atlanta. But he advises picking shows carefully, looking at the economy of the local area, and talking with other small exhibitors about which shows really draw the buyers they claim to.

So far, Semler has done most of the selling himself. He has one part-time rep in southern California, but he is "working on setting up a dealer network. It's the next important step; I just can't do it all myself."

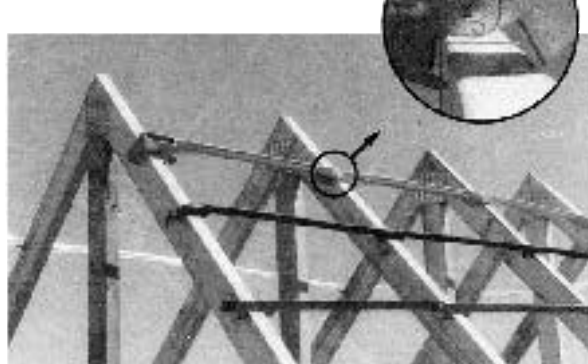
The response he gets from his customers — and he keeps in touch — is what keeps Semler going, along with the chance to make improvements. He's already experimenting with a "Plumb-It" that will incorporate an electronic module, and another that will allow buyers to use their own lev-

els. And he's looking forward to brand new products. "You know it'll be easier after what I've gone through the first time." ■

Contact Paul Semler at Plumb-It, 3045 North Dodge Blvd., Tucson, AZ 85716; 800/759-9925.

— Paul Spring

Eureka!



Mike Jarvis invented Truslock because he knew there had to be a better way to brace trusses during installation. His current version, shown at the top of the truss chord, folds like a wooden ruler and bites with sharpened metal points (inset). Earlier hand-made prototypes are lined up lower on the trusses.

It happened one afternoon. As Mike Jarvis sat down to lunch with his crew, he imagined a big pair of pliers clamping down over a truss chord. "That's it!" He finally saw a solution after years of struggling with a design for a tool that would replace the temporary bracing used to set roof trusses. He hurriedly sketched out his new idea: a series of measured sections of metal. The sections would fold out like a wooden ruler, and sharpened metal points would bite into each truss to hold it secure until the roof was decked. That evening, Jarvis made the first pair of Truslocks.

Jarvis saw the need for this tool on his first job putting up trusses back in 1971. Two problems that were "just part of the job" to other builders caught his attention. First, the speed of the job depended on one person: the guy on the plates installing lateral bracing. To make the job faster, it was standard procedure to nail long runs of bracing on to the first few trusses and work new trusses underneath the bracing with the crane. But far too often, the crane accidentally stripped the bracing right off the entire job, sometimes bringing a man down with it. Second, it was difficult to hold the trusses both plumb and on the layout. Invariably the crew had to go back and straighten out the trusses.

This haphazard approach worked well enough on a small job. But as truss manufacturing evolved, the jobs got bigger and bigger. The day Jarvis finally saw the answer to his problem, he was setting 80-foot trusses, ironically, on a new wing of a truss plant. These monsters didn't move very easily. So when Jarvis sat down to lunch he was tired and frustrated. "Something has to give," Jarvis thought. The job of installing the trusses has to evolve as the trusses do.

Jarvis doesn't think of himself as an inventor or a manufacturer, even though he designed, manufactures, and markets his tool. He still thinks of himself as a contractor. And he's proud of his "contractors' approach to product development."

Jarvis has sold about 14,000 Truslocks. Most of these have been sold out of his office by phone. Jarvis thinks this is a drop in the bucket; the potential for sales is huge. He tried other sales approaches. He first attempted to market his tool to distributors. But dealers didn't sell many tools because they were unfamiliar with the job. Jarvis also presented Truslock to some manufacturers of truss plant machines. They kept his tool for about 60 days and sent it back. From their perspective, it wouldn't sell. Jarvis feels this reflects a prevalent attitude in the manufacturing industry. "Their point of view is colored green," he explains. "The only concern they show for the installer is a lot of talk that will protect themselves from liability."

The first attempts to get a patent on Truslock were discouraging, as well. The tool was denied a patent on the grounds that there is nothing new in the design. The patent office considered it a tool made of borrowed parts. The folding rule, a set of gauges used to space railroad ties, and a certain pecan crackers were cited by the patent office as examples of similar design. To gain a patent, Jarvis had to write an appeal that proved it was a unique tool for a unique purpose. But even this appeal was rejected. Finally, Jarvis' attorney went directly to the patent office. He pleaded his case to a department supervisor, explaining that the tool was misunderstood because the job itself was new to the building industry. The supervisor made a few insignificant changes and told the attorney to put it through again. Jarvis was awarded not only the patent, but a methods patent as well.

Perhaps Jarvis' greatest asset is his undying conviction to improve the job. "This is a conviction any good contractor has," Jarvis says. But it's an attitude few product manufacturers are quick to support. ■

Contact Mike Jarvis at Truslock, Rt. 1, Box 135, Calvert City, KY 42029; 502/898-3365.

— Clayton DeKorne