

# Stainless Steel Clamp Thwarts Catalytic Converter Thieves

*Investment casting process offers design and cost advantages for rugged cage-like device.*

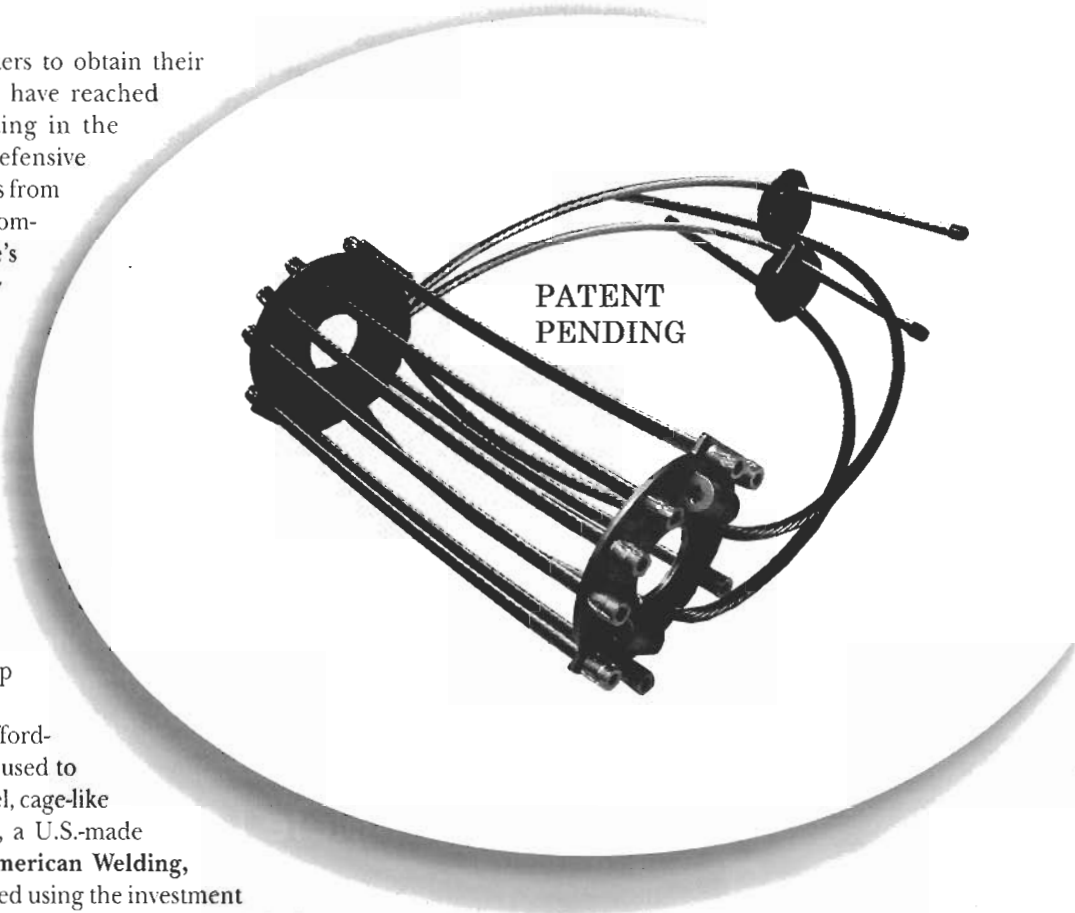
**T**hefts of catalytic converters to obtain their precious metal contents have reached pandemic levels, resulting in the development of a number of defensive devices designed to prevent thieves from cutting the “cats,” as they are commonly known, away from a vehicle’s exhaust piping. In what is quickly becoming an all-too-familiar crime, the thief slips under a target vehicle—most often an SUV or truck with ample clearance—and, with a reciprocating saw, slices through the exhaust pipe on either end of the catalytic converter, freeing it for removal. The operation takes about 10 seconds and may yield the criminal anywhere from \$50 to \$250 or more from a scrap yard or recycler.

Reportedly one of the most affordable and foolproof designs that is used to combat cat rip-offs is a stainless steel, cage-like device known as the CatClamp™, a U.S.-made innovation manufactured by **American Welding, Inc.**, of Toledo, Ohio. Manufactured using the investment casting process, the CatClamp is a rugged, stainless steel theft deterrent system that can virtually eliminate the theft of catalytic converters, according to the manufacturer.

“Thieves simply find that it’s too hard to cut through the CatClamp’s 300-series stainless steel,” says Jim Dusa, American Welding president. “This grade of metal is often cut by industrial lasers, so using a reciprocating saw would take too long and be too noisy. When a thief sees our device, they know they had better move on.”

The reason for the plague of catalytic converter thefts is that these emissions control devices contain platinum and palladium, two highly precious metals that serve as the oxidizing catalysts. These catalysts remove several pollutants from a gasoline engine’s exhaust stream. Platinum, the more expensive metal, sold for \$600 per ounce five years ago. In 2008, that price had already soared to over \$2000 an ounce, making platinum far more valuable than gold.

Although the losses from catalytic converter thefts and related



The CatClamp device essentially envelops a catalytic converter in a cage-like system. Two alloy collars lock at both ends of the converter, and a special aircraft cable runs between the collars, forming the cage. That same aircraft cable then locks the whole unit to the vehicle frame. The CatClamp can be installed with one specially designed tool in 20-to-30 minutes, the manufacturer says, without drilling, cutting, or welding. Image courtesy of American Welding, Inc.

exhaust system damage are often very substantial, ranging into the thousands of dollars, Dusa says he realized early on that his theft deterrent needed to be very high in quality, yet still carry an affordable price.

“I felt that the product should sell for a starting price as low as \$250,” Dusa says, “and should be sold in a kit that could be installed by the purchaser. Yet the 300-series stainless was a key material, so we had to be very careful with manufacturing costs.”

According to American Welding, investment casting was “the ideal process for making a high-quality clamp that was not only very hard and durable, but also affordable, even in smaller quantities.” When the CatClamp was launched in 2007, it was initially fabricated from laser-cut stainless steel that was welded and machined. Because Dusa’s firm had many years of metal fabrication and finishing experience, the finished product “looked very professional and certainly worth the money it cost,” according to the company.

Still, Dusa wasn’t satisfied. Although he was using what he believed to be the most efficient manufacturing technology, it was a “seemingly impossible challenge” to make the product available for \$250, especially because of the high costs of welding and machining. In order to contain costs and produce to the highest quality, Dusa decided to consider investment casting the CatClamp. Investment casting is, basically, the precision casting of metal shapes from a heat-disposable pattern by injecting wax or plastic into a metal die. This is sometimes called “lost wax casting” because when the assembly is baked, the wax (or plastic) escapes



through openings in the outer mold, leaving a cavity into which the molten metal is poured.

Dusa knew the reputation of **Rimer Enterprises** ([www.rimerinc.com](http://www.rimerinc.com)), a state-of-the-art investment-casting specialist based in nearby Waterville, Ohio. Since 1944, Rimer Enterprises has offered investment casting capabilities for items weighing from less than an ounce to 30 pounds, in quantities ranging from one piece to 1,000,000. The company serves a variety of industries, both domestic and worldwide. Products cast by Rimer range from railroad to food processing applications, and most of the pieces are composed of carbon steels, stainless steels, bronze, brass, or aluminum.

“I was very confident that Rimer could do a great job investment casting our product,” Dusa explains. “Equally important, they were known for advanced design and engineering capabilities, which meant I could work with them to see if investment casting was the best way to make the CatClamp, and then fine-tune it from there.”

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Using investment casting to manufacture the CatClamp, Dusa explains, “was actually easier than anticipated, with their engineers using CAD illustrations of how they thought the pieces should be made, in collaboration with our own design work. That all went smoothly and very efficiently. I believe that we had

our first finished products in about three weeks." He adds that the investment casting process was "a lot faster and much less expensive than other metal casting technologies." The finished components, he says, "were virtually perfect" and required little, if any, machining.

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Those familiar with investment casting know that the detail and tolerances achievable by the process can be amazingly accurate. For that reason, the technology is used by sculptors and other artists to make fine reproductions of coins, medallions, and other art pieces. However, the challenge in making the CatClamp was to keep the unit price low, and in the end,

the price was exactly in the range that Dusa and Rimer had aimed for.

Another advantage of using investment casting is that investment-cast parts can contain alloys that make the part much stronger than otherwise. Also, the ability to consolidate multiple parts into a single structure can add strength and reduce costs.

"Rimer is very good at fine-tuning designs so that they will work best," Dusa says. "They are very pro-active at that. They make a lot of suggestions on how to improve the design or the finished item itself."

Since beginning to investment cast parts for the CatClamp about a year ago, American Welding and Rimer Enterprises have collaborated to simplify the product so that fewer models were needed to fit most cars and trucks. Today, the line includes only seven different models. Three of those models cover approximately 80% of vehicles.

More information on the various CatClamp models is available at [www.catclamp.com](http://www.catclamp.com).

***Edited by Design-2-Part.***