

STILL MADE IN AMERICA



The Story of Robert Slass
and his Contribution to US Manufacturing



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Dedication

There are many companies who have chosen to tell their story to the public in print picture books and online eBooks. We are sure they are genuinely proud of what their companies have accomplished and satisfied to present their achievements in words and pictures.

But in telling the story of Robert Slass, mechanical engineer and entrepreneur who started Rotor Clip in 1957, we'd like to take it a step further. We'd like to show you how his skill and forward thinking created a dynamic manufacturing environment that is as relevant today as it was when Rotor Clip first opened its doors.

For too long, we have been under the misconception that manufacturing is a place of dirty jobs for uneducated people. The truth is that factories are not only places for skilled mechanics, tool makers, and engineers; they are also a place where the latest technology offers careers in just about every function found in a typical service or retail enterprise, including purchasing, accounting, customer service, sales, marketing, quality control, and more.

Specifically, jobs in manufacturing today are careers requiring college level skills as well as manual dexterity. 3-D printing allows our engineers to design parts for our machines and see how they work before producing them using precious toolmaker and operator time.

Typical machines in a manufacturing environment are equipped with more than an on/off switch; many are digitally controlled to collect data and present to management an accurate picture of how well those machines are functioning. Operators check quality using tools interfaced to computer programs and participate in value stream teams to share ideas on how to improve every aspect of the production process.

IT is prevalent in every corner of the plant using critical customer, raw material and machine data to schedule customer requirements and produce product according to these requirements. Mass production has been replaced by mass customization and the ability to satisfy a customer need quickly separates a global company from one not able to compete in a worldwide market.

This book is more than a tribute to Bob Slass, American entrepreneur, engineer and visionary. It is a call for an awareness of the importance of U.S. manufacturing and its contribution to our economic success. In addition to telling Bob's story, it looks at the many opportunities today's manufacturing facilities present to young people. Look for the Manufacturing Career Focus sections to see what is available in today's modern factory.

We hope you will view this book not only as a chronicle of Rotor Clip's success but also as the beginning of a new awareness of manufacturing and the promise it holds for our country and its people.

Joe Cappello
January 2016



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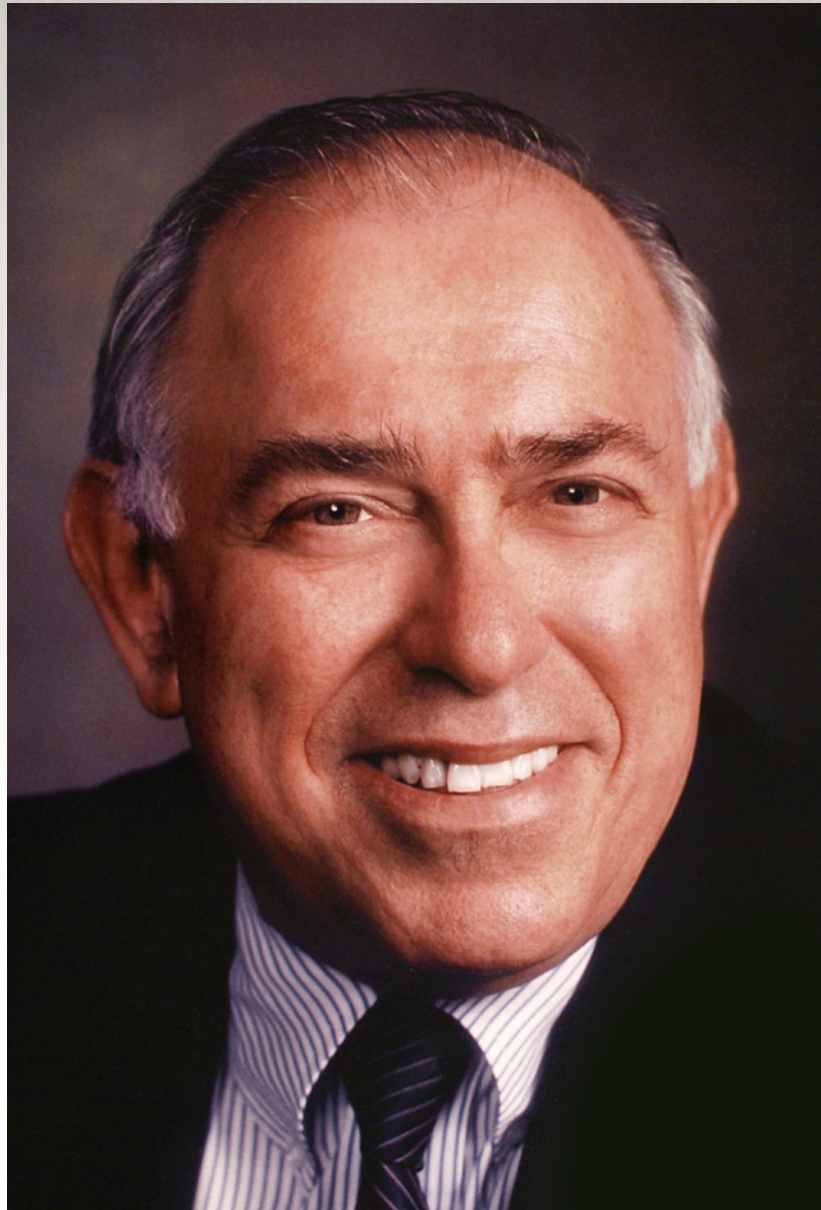
187 Davidson Avenue

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ROBERT SLASS

ENTREPRENEUR • ENGINEER • VISIONARY



1928 -2009

Robert Slass was born in the borough of Queens, New York City, on August 8, 1928. He was a graduate mechanical engineer and a successful entrepreneur, who started Rotor Clip Company in 1957 as a manufacturer of retaining rings. He was a brilliant man with a photographic memory and a love of science and engineering. Over the years, he shaped Rotor Clip into the world leader it is today in the production of retaining rings and related products. But for those who knew him best, he was all about passion and an unwavering belief in American capitalism as a force for good in our country.

Bob couldn't imagine anyone coming to work and not enjoying it. To him, work wasn't a place to mark time while waiting for some distant retirement. Rather, he encouraged his employees to do their very best and not accept mediocrity or a passive "9 to 5" attitude. He made work exciting and challenging and loved to see people involved and passionate about their work. He was demanding and insisted on accountability, but his methods produced an interested, motivated work force that took pride in Rotor Clip and in the jobs they did.

American capitalism and its ability to make a better

life for those who were motivated and willing to work hard was Bob's mantra. His Rotor Clip is an example of capitalism at its finest, providing meaningful jobs for a variety of people with varying skills and education levels, all with an opportunity to make the American dream work for them.

Bob was unstoppable when he set his mind to a project, picking up what he didn't know from books and magazines, and filling

in with conversations with those who had the information he wanted. He would watch a machine work at a facility, then draw it and make it happen at Rotor Clip. Perhaps one of our customers said it best: "... (Bob is)... a man who stands as a leader in manufacturing, and a great example of what one can achieve when one uses the gumption we are all born with."

There are volumes written about the meaning of life and what we are to accomplish for the short time we walk the earth. Bob would have shrugged at such talk as the bantering of academics and those with far too much time on their hands. But if there is one lesson from his life that we can take with us, it's his singularity of purpose and total devotion to a vision as manifested through Rotor Clip, his own creation.



JONATHAN & CRAIG SLASS

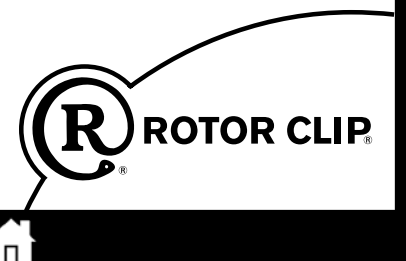


CO-PRESIDENTS/OWNERS
ROTOR CLIP COMPANY, INC.

Since entering the family business in the early 1990's, Jonathan and Craig Slass have positioned Rotor Clip as a global supplier of retaining rings (non-threaded fasteners), wave springs and self-compensating hose clamps for automotive and other industrial applications. They have accomplished this by instilling a culture of cost reduction and improvement utilizing the latest technology to accomplish both goals. Service has also been key in this transition as Rotor Clip engineers and sales personnel work together to meet the needs of the customer.

Jonathan is currently a member of the Society of Automotive Engineers (SAE) and the American Society of Mechanical Engineers (ASME). He also serves on several non-profit boards in the area and holds a B.E. in Mechanical Engineering from Vanderbilt University, Nashville, TN.

Craig is currently a member of the National Fastener Distributors Association (NFDA), the Power Transmission Distributors Association (PTDA), and the Bearing Services Association (BSA). He has been active in supporting programs that stress education and technology particularly as they apply to manufacturing.



What is a Retaining Ring?



Tapered Section Retaining Rings



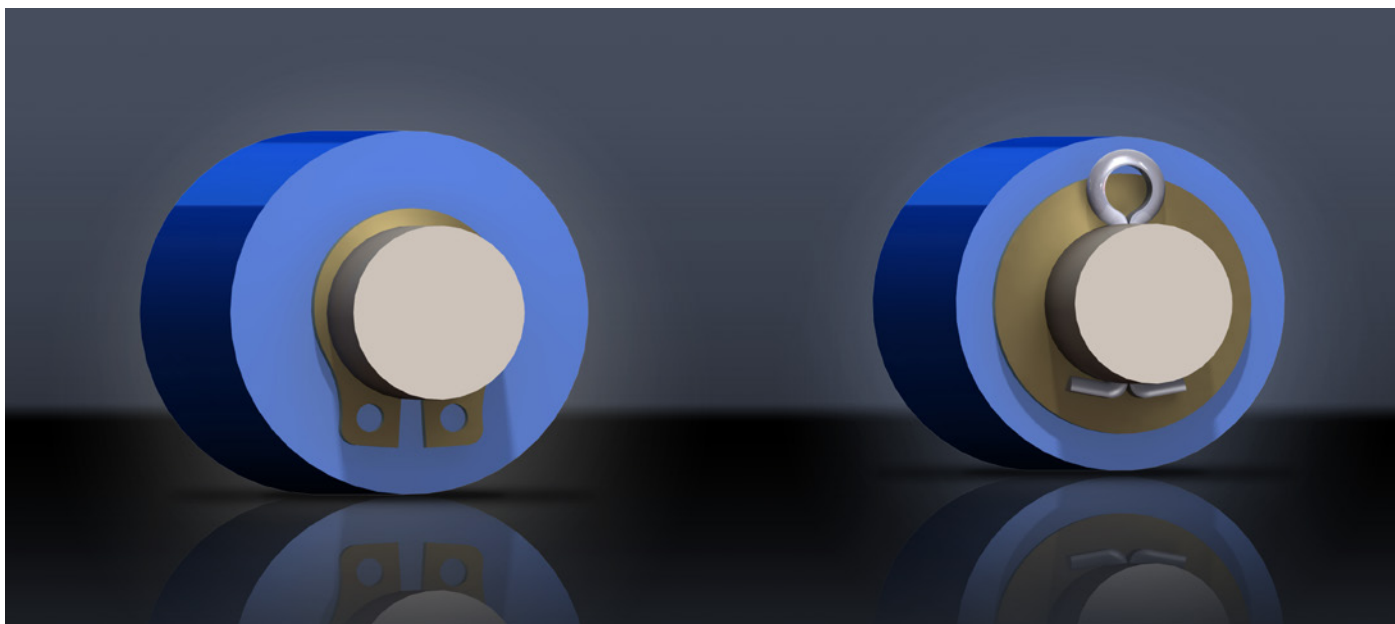
Constant Section Retaining Rings



Spiral Retaining Rings

*R*etaining rings are metal fasteners that are installed into a groove on a shaft or in a housing or bore creating a shoulder that retains an assembly. They eliminate threading, tapping, drilling and other machining operations associated with more traditional fasteners like screws, nuts, bolts, cotter pins, washers and more.

They can significantly reduce production costs since the grooves can be machined with other production processes. Overall they provide a more compact, functional design than their traditional counterparts.



Cost-saving method of fastening with a Rotor Clip retaining ring.

Traditional method of fastening.



The story of Robert Slass and Rotor Clip, the company he founded in the late 1950's, is one of innovation and vision. Bob understood that trends change as they did in the 1980's and 1990's and that companies had to adjust if they were to survive. As an engineer, he took the lead in demonstrating to the manufacturing community how using retaining rings instead of traditional fasteners could result in significant savings without sacrificing quality and reliability.

The response was overwhelming as more and more automotive related and general industrial companies made

retaining rings their fasteners of choice when designing and manufacturing the many assemblies that comprise their products. Rotor Clip has been at the forefront of this trend for the last several decades and the many product and process improvements Bob Slass pioneered in the production of retaining rings are still serving the global industrial marketplace today.

Here are some examples of how industry is currently using Rotor Clip retaining rings.



Gear retention is a common application for SH retaining ring shown above



SH retaining ring used on cam shaft assembly.



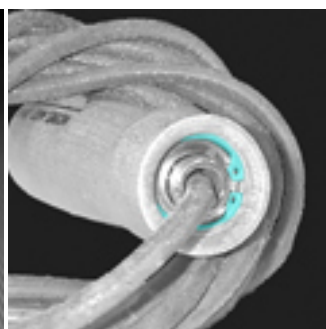
HO rings in steering rack housings.



An HO ring retains the valve on this cast assembly.



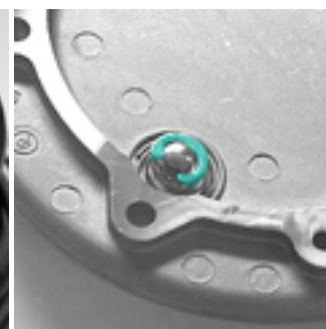
HO ring retains the valve of this fuel rail assembly.



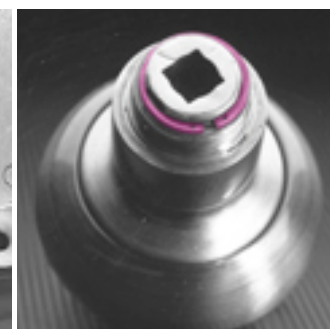
HO ring retains the bearing in the handle of a jump rope so that it can be easily replaced.



PO ring features large shoulder abutments for effective retention of the shaft.



RE retaining ring on a check valve assembly.



Inverted SHI ring on a door knob assembly.

What is a Retaining Ring?



Here are some of our favorite Bob Slass photos
we have accumulated over the years.

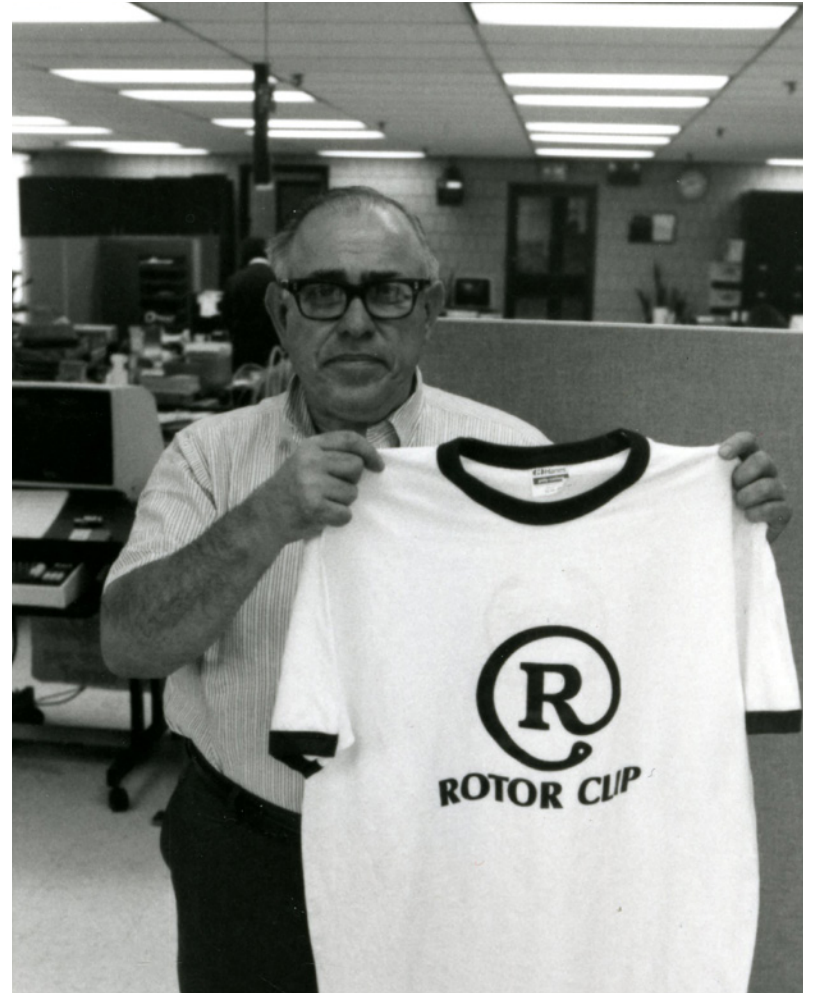


Bob Cart





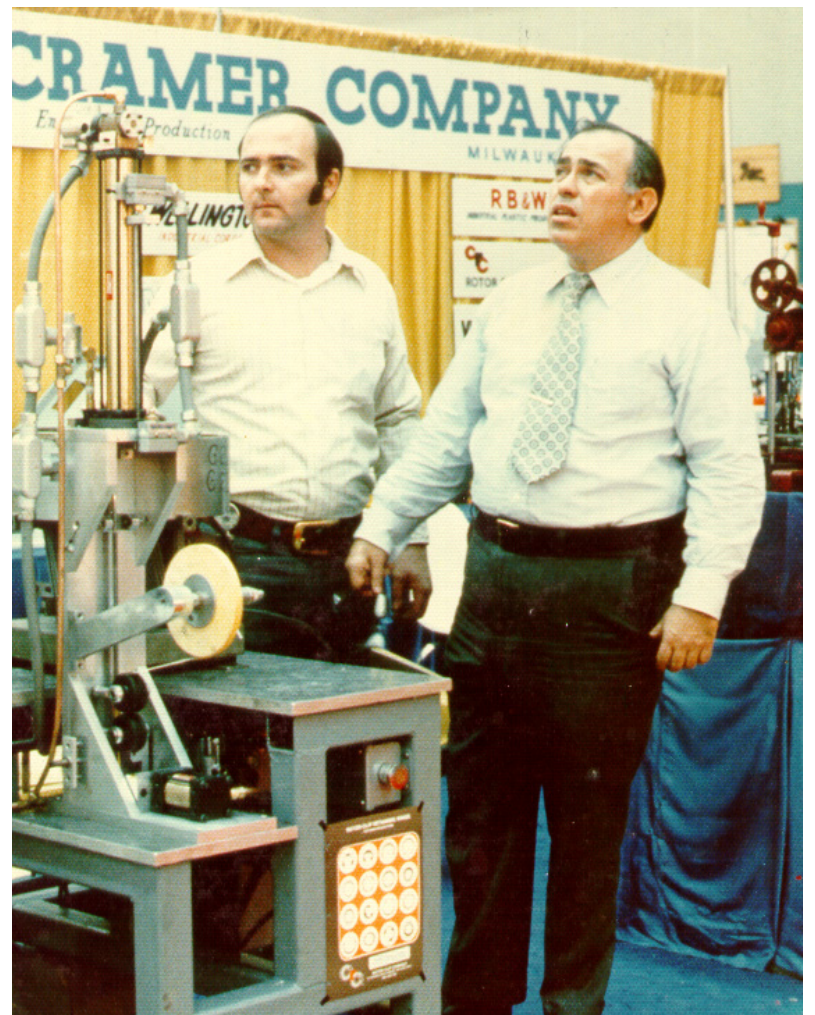
Bob poses in the Rotor Clip conference room with the quality awards Rotor Clip had acquired at the time from GM, Ford and Chrysler.



Bob holds up a typical Rotor Clip T shirt. For the last 30 plus years, the marketing department has produced a T shirt with a different design every year for all employees.



A young Bob Slass after he opened Rotor Clip.



Bob at one of the first trade shows Rotor Clip attended (circa 1970's) with employee, Rich Malone.



Bob Slass parked at work in the original Farmingdale building (1957) with the rest of his “staff.”



Bob shown with sons Craig (left) and Jonathan after winning the PTDA Trailblazer Award in 1998 for its innovative online training program.



Bob at work on the bridge that connected the 1st floor of Building 1 with the second floor of Building 2. Bob designed and built these two buildings with the help of Rotor Clip employees.



Bob accepting a quality award from a customer.



Bob with QA Manager Bruce Rudin.



Bob with Evelyn Brodsky after presenting her with a plaque marking her nearly 40 years of service to Rotor Clip. Evelyn was one of the first employees Bob hired when he moved to the Bronx in 1960.





Bob Slass with Rotor Clippers Lisa Coiro (left) and Maureen Balint (right).



Bob addresses the Rotor Clip family at the company's annual holiday party in 1996.



Bob with wife, Gloria.



Bob Slass in the Rotor Clip tool room. This group has been responsible for producing and maintaining the dies and their assorted parts for making Rotor Clip retaining rings, wave springs and self-compensating hose clamps.



Bob draws a winning ticket for the lucky son or daughter of a Rotor Clip employee who will win the Kermit the Frog doll he is holding. Rotor Clip sponsored numerous summer picnics over the years for Rotor Clip employees and their families.

The Promise of Freedom

Q. “What did you learn in school today?”

The story of Ike and Bertha Schloss is a familiar one that played out around the world in the late 19th century. People oppressed sought to make a new life for themselves and their families and to live unafraid of the ominous knock on the door that might bring imprisonment or even death. Most of all, they wanted access to education and a place where they could nurture talents and grow in a fair and supportive environment.

Who knows what thoughts were in the minds of the young Ike and Bertha when they boarded a ship for New York in 1890. He was 25, she was 15. Their native Latvia in Russia was in the midst of pogroms aimed at the Jewish population and fueling an anti-Semitism that seemed tacitly sanctioned by the very government that was supposed to protect them. We can only assume that they had had enough.

The couple settled in Jamaica, Queens and had five children: Harry (Bob Slass' father), Barnet, Herman, David and Freda. As so often happened in those days, the name “Schloss” became “Slass” as evidenced on the 1910 Census record listing the Slass family. The senior Ike worked as a carpenter and built the house the family lived in with his own hands. He instilled a respect for education in his family as evidenced by the professions of his sons: Harry became a mechanical engineer, Barney, a civil engineer, Herman, a

surgeon, and David, an engineer who served on ships as a manager of the boiler operators. Freda married a business man and together they opened a successful retail business.

Harry J. Slass met Anna Levy who arrived from England in 1904. The two were wed on June 1, 1918. They tragically lost their first son, Frederick, in 1929 to kidney failure. Their second son, Robert, was only a year old. Two years later, Harry and Anna sought to counter their grief at the loss of their eldest son with the birth of twin daughters, Charlotte and Dorothea.

Dorothea Slass recalls that her father, Harry, was brilliant, very serious and “a very good provider for his family.” Harry was a skilled mechanical engineer who worked on weapons systems in 1918 to support the war effort and a variety of other engineering related jobs.

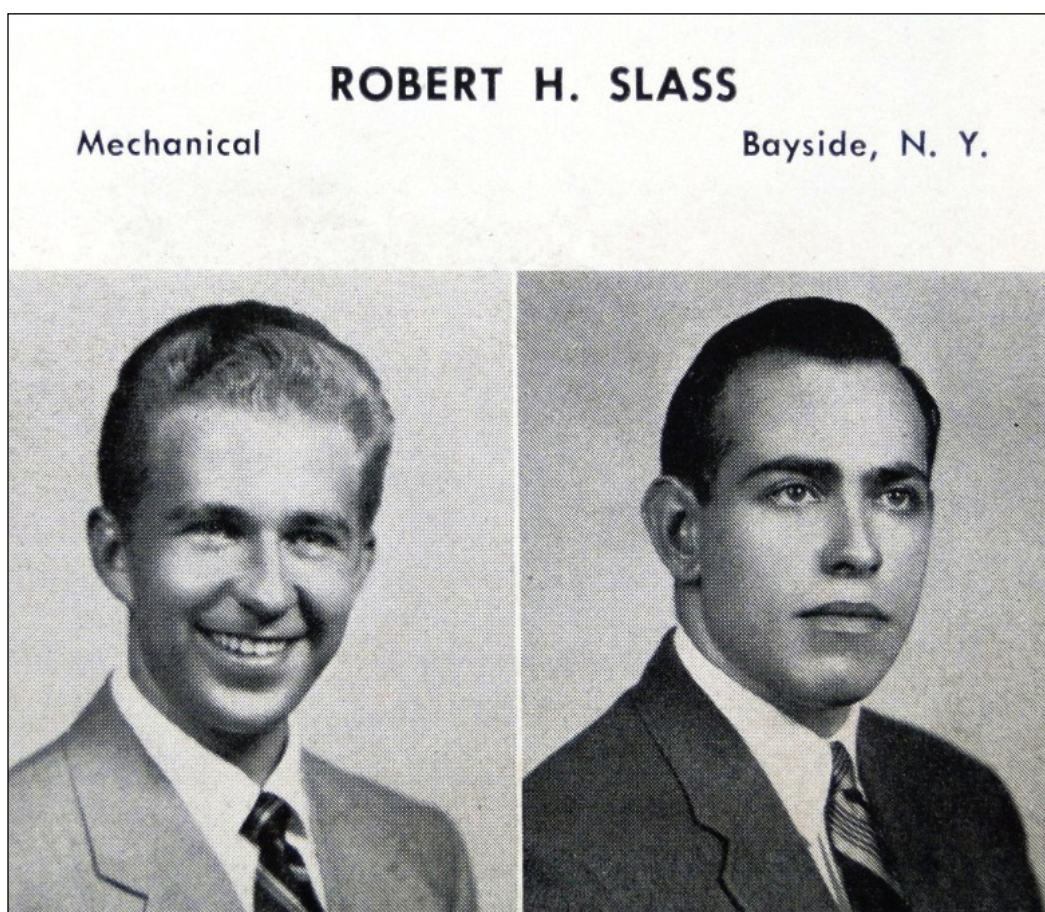
Harry Slass was equally focused on education as in his parents' home and would often ask his children, “What did you learn in school today?” As Dorothea recalls, “He would test us on what was in the newspaper on a given day.”

Her recollections of her brother, Robert, are along the same lines. “He was a very serious person,” she recalled, noting that he was involved in more studious pursuits while the other boys in his neighborhood were out playing. “He schooled himself and became a self made man.”





A young Bob Slass practicing his violin. He auditioned for the New Orleans Symphony Orchestra while attending Tulane University.



Bob Slass enrolled in the mechanical engineering program at New York University and graduated in 1956 (pictured on the right).

Bob was classically trained on the violin and put in the necessary hours to become an accomplished player at a very early age. He was to apply the disciplines he learned then to business and engineering.

But it was Bob's father, Harry, who would have the greatest influence on him and sow the seeds of entrepreneurship that eventually led to the founding of Rotor Clip. His love of all things mechanical was rooted in his childhood. As a young boy, he often went to the places where his father worked. Here, the younger Slass marveled at the mechanical wonders around him. He watched closely and learned from his father whose dedication to his work became a model for him to follow.

In an article in Distributors Link, in 1987, Bob was quoted as saying, "To this day, I order materials my father said were the very, very best."

Harry Slass recognized his son's talents and urged him to pursue a career as a medical doctor. But as fate would have it, Harry would not be around to see the path Bob would take; he died at the age of 54 in 1947. Bob was only 19 years old.

As is the case with so many young sons eager to please their father, Bob accepted his father's choice of a career for him though he harbored misgivings from the very beginning. After stints at medical schools in Scotland and New Orleans, he came to a realization one day. His true passion was engineering and he wanted to pursue it to the fullest. .

"That's when I decided I would succeed in business," Bob later recalled.

In his heart Bob knew he was free to shape his destiny and pursue his own American dream.

He entered the Mechanical Engineering program at New York University and never looked back.

The Promise of Freedom

The 1905 Census showing Ike and Bertha along with four of their five children living on Pike Street in Manhattan.

[illegible]

Names	Gender	W	H	Age	Native State	Age	Profession	Remarks
Worsfold	Head	W	M	40	Russia	16	Al	Carpenter
—	Wife	W	F	30	Russia	16	Al	Housework
—	Son	W	M	12	United States	Ex	At School	18, X
—	Son	W	M	8	United States	Ex	At School	18, X
—	Son	W	M	6	United States	Ex	X	X
—	Son	W	M	4	United States	Ex	X	
—	Head	W	M	34	Russia	8	Al	P

The 1905 census showing Ike and Bertha Slass along with four of their five children living on Pike Street in Manhattan.

The Early Days

With his education in full swing attending classes at night at NYU, Bob was ready for his first job. He was prepared to take work in his chosen field, mechanical engineering. But deep inside he harbored a thirst for entrepreneurship and a chance to run his own show, working with his mind and hands to create something that would be uniquely his.

But the 1950's was the decade of optimism and Bob was swept up in the fervor. There was much to be done as America emerged from the Second World War a strong manufacturing power poised to dominate global economics for decades to come.

If Bob was responding to the urge to be an entrepreneur, he was no doubt responding to the innovation of American companies taking place all around him. In 1950 Xerox produced the first copy machine and RCA demonstrated the first single electron color television tube. In 1952 General Motors earned \$558 million and in 1953 Boeing expanded production of the B-52 bomber. In the same year the US economy grew 5% more than 1952 levels to \$368 billion. Bob was eager to make his mark but also willing to start slow and methodically gaining knowledge and experience in the whirlwind of innovation taking place all around the country.

“I made dies according to the 1950's advances available.” –Bob Slass

In 1953 he took a job with a company with a long history in the U.S. called Waldes Truarc. [Waldes](#) followed a rather circuitous route from a manufacturer of zippers and metal fasteners for the garment industry to the leading producer of retaining rings in the US by the 1940's.

Waldes had been a European company who pioneered the use of snap fasteners for dresses in the early 1900's. They were extremely successful and established factories in Paris, Dresden, Barcelona and New York.

The American company was established in Long Island City, NY in 1919 with 25 employees and incorporated as Waldes Koh-I-Noor, a trademark adopted in 1902 from the famous diamond of the same name. The Company's corporate name was changed to Waldes Kohinoor, Inc., minus the hyphens in 1958.

The New York Company successfully produced snap fasteners, zippers and other accessories for fastening garments for many years. However, the Waldes facility in Prague was seized by the Nazis during World War II. In 1945 the company was nationalized by the Czechoslovakian government. (Footnote—this facility was purchased by Rotor Clip in 2011, two year's after Bob Slass' death).



How Waldes made the transition from producing garment fasteners to retaining rings began with a field exercise carried out by the US military in World War II. According to the industry story, the military captured a German tank on the battlefield. They dismantled it and noticed that many components were held together by retaining rings. Retaining rings were a German innovation with the first patent filed by Hugo Heiermann in 1930, but the product was never fully embraced by US manufacturers.

Fascinated by the technology and eager to apply it to their own equipment, the military sought to set up a producer of retaining rings. Waldes was already manufacturing bombtail fuses, 20 mm. anti-aircraft projectiles, zippers, and other equipment for the American war effort at its Long Island City facility. The military persuaded the company to take on the project and in the 1940's it successfully produced the tooling needed to manufacture a line of retaining rings under the Waldes Truarc brand.

The company was awarded the Army Navy "E" for the excellence of its products for their contributions to the war effort.

Waldes continued to produce retaining rings after the war. They hired field engineers to teach designers in US manufacturing companies how to replace traditional fasteners like screws, nuts and bolts, cotter pins and washers with lower-priced, more efficient retaining rings. As industry took



Bob Slass working his first job as an engineer at Waldes Truarc, an early manufacturer of retaining rings.

off in the 1950's, so did the use of retaining rings when Bob landed his first job at Waldes Truarc (the name given to the retaining ring end of the business) as a designer/draftsman.

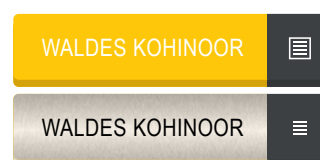
Initially, his job was to check the accuracy of engineering drawings from which the tooling was made to produce the retaining rings. As he progressed, he began to design the actual tooling needed to stamp out the specialized shapes and sizes of the many retaining rings the company produced. In this capacity, he joined a distinguished stable of mechanical engineers and together they became experts in the new product line and were instrumental in setting standards and adding new designs to the standard line. He learned everything he could from these experts.

"I made dies according to the 1950's advances available," Bob later recalled. This critical knowledge formed the basis of success for Rotor Clip as Bob later improved on these early designs and made his mark on retaining ring technology that would set new industry standards.

But Bob was not one to live in the theoretical world of the draftsman's board. He spent hours watching the stamping presses, heat treating, finishing, etc., all the time formulating in his mind how he could do the same work faster and more. This rankled his supervisors who wanted the young Slass to confine himself to his draftsman's board.



Prior to working at Waldes Truarc, Bob Slass considered entering the toy business. He came up with this idea for a puzzle toy, (Form-A-Design), but never pursued it.



The Early Days



Bob received his degree in mechanical Engineering from New York University in 1956. The following year, 1957, was momentous for New York as both the Brooklyn Dodgers and New York Giants left the city for greener and more open pastures in California. It was also the year Bob left Waldes and spent a short time with a competitor, Industrial Retaining Ring, in Irvington New Jersey.

But by the fall of that year, Bob knew the time was right. New York was the undisputed national leader in man-

ufacturing (though that would change as companies relocated to the South and West in the next decade).

The stage was set for a new enterprise, one that Bob Slass would create with his own hands in the true spirit of American capitalism.

WALDES KOHINOOR



The Army Navy "E" Award was an honor presented to a company during ["World War II"](#) World War II for excellence in production of war equipment. The pin shown above was presented to all employees in the plant at the time the award was made. Waldes was one of 4,283 companies to receive the award in the course of the war. [1] This amounted to about 4 percent of the companies engaged in war work. (source: [wikipedia](#)).



Xerox introduced the model 914, the first plain paper copier and believed to be the most successful single product of all time. (<https://en.wikipedia.org/wiki/Xerox>).

NEW YORK CITY 189



REG. U.S. PAT. OFF.



UNDER the direction of specialists from the Prague plant of Waldes & Co., this factory in Long Island City—equipped with exclusive and patented machinery—is now producing the **Koh-i-noor Triumph Snap Fastener.**

the fastener used and endorsed by the world's leading fashion creators.

WALDES & CO., Inc.

FACTORY:
Creek Street and Anable Avenue
Long Island City

SALES OFFICES:
315 Fifth Ave.
New York City



The Largest Snap Fastener Plant In America

An early ad for Waldes Kohinoor. The company made fasteners for the garment industry until the U.S. government put them in the business of manufacturing retaining rings for the war effort.

The Early Days



Waldes Kohinoor-From Snap Fasteners to Snap Rings

Waldes had been a European company who pioneered the use of snap fasteners for dresses in the early 1900's. Prior to this product, buttons, and hooks and eyes were considered the only satisfactory apparel closures at the time. The company was established by Jindrich Waldes, a talented businessman and entrepreneur who made a lasting mark on the garment industry both in Europe and the US.

Jindrich was born in 1876 in Nemyal, a small village in southern Bohemia which then was part of the old Austro-Hungarian Monarchy. At age fourteen he served an apprenticeship with Roeders, a feather firm in Prague (in the present day Czech Republic). He left Roeders and got a job with Lokesh & Son, a company located in Holesovice, an outlying district of Prague. The firm made buttons for the fashion trades and it was here that he gained a broad knowledge of the business and its manufacturing processes. Jindrich turned out to be a good salesman as well and by age nineteen he was traveling all over Europe selling Lokesch collar buttons. His journeys took him as far as Constantinople, where he sold buttons to the Turkish army.

Working with his mentor, Hydek Puc, Waldes rented a small shop in Holesovice and after much experimentation in 1900 produced snap fasteners for dresses. Snap fasteners had been widely used at the time but what Messrs. Puc and Waldes succeeded in doing was automating what had previously been a highly manual process. They were thus able to provide volume production in a fraction of the time it previously took to produce the product.

The first twelve dozen were purchased by one of the leading fashion stores in Prague, which was used to secure ladies' dickies.

Waldes and Puc formed Waldes & Company, which was located in Prague. Waldes was successful in interesting many of the leading countries in Europe in the new snap fastener, and demand for the product made it possible to establish factories in Paris, Dresden, Barcelona and New York.

The American company was established in Long Island City, NY in 1919 with 25 employees and incorporated as Waldes Koh-I-Noor, which came from a trademark Jindrich had adopted in 1902 from the famous diamond of the same name. The Company's corporate name was changed to Waldes Kohinoor, Inc., minus the hyphens in 1958.

The New York Company successfully produced snap fasteners, zippers and other accessories for fastening garments for many years. However, the Waldes facility in Prague was seized by the Nazis during World War II. In 1945 the company was nationalized by the Czechoslovakian government.

Conditions in Europe rapidly deteriorated and Jindrich Waldes was seized by the Nazis and imprisoned in the Buchenwald concentration camp. His health undermined, he died on arrival in Havana, Cuba, on July, 1, 1941. He was put to rest in American soil.

His brother and lifelong business partner, Sigmund Waldes and his two sons, George and Milo Waldes; and his nephew; Sigmund's son, Harry Waldes carried on the development and enlargement of the Long Island City company. Harry Waldes was no doubt one of the people the young Bob Slass met in 1952 as he answered an ad for a job as a mechanical engineer.

The company eventually became the leading producer of retaining rings in the United States during the war, which were also known as "Snap Rings."

Waldes Kohinoor





Jindrich Waldes with František Kupka. The two met in 1919 and Waldes became Kupka's benefactor. Kupka produced the Miss Kin painting which became the logo for Waldes Kohinoor.



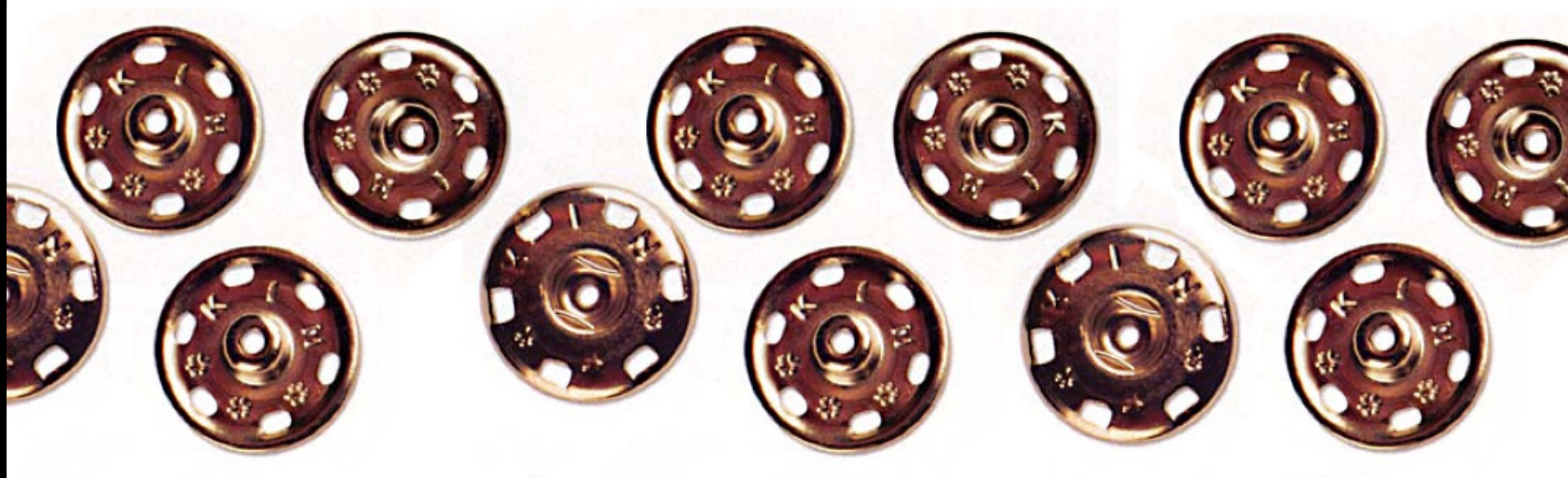
Waldes museum in Prague 1916. The collections were dedicated to the study and exhibition of clothing fasteners.

Waldes Kohinoor



*The Kohinoor, "Miss KIN" logo shows the face of a laughing girl with a snap fastener on her eye. The trademark was reportedly created by accident when **Elisabeth Coyens**, a red-haired American girl who is the depicted in the logo, placed the fastener on her left eye like a monocle. The painting was made by Frantisek Kupka, a close friend of Jindrich Waldes.*

Snap fasteners manufactured by Waldes Kohinoor



Waldes Kohinoor

 ROTOR CLIP®

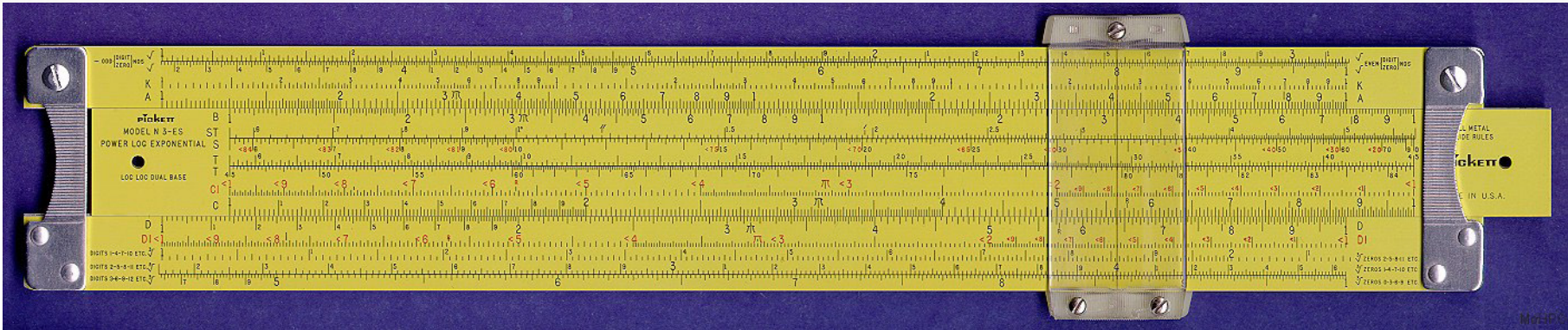


Old engineering tools used by Bob Slass in his first job.



T square

slide rule



drafting board



Waldes Kohinoor



Manufacturing *Career* Focus

Tool and Equipment Design for the production of products

MECHANICAL ENGINEERING

Mechanical engineering is a discipline of engineering that applies the principles of engineering, physics and materials science for analysis, design, manufacturing, and maintenance of mechanical systems. Mechanical engineers use tools like computer-aided engineering, and product lifecycle management to design and analyze manufacturing plants, industrial equipment and machinery, heating and cooling systems, transport systems, aircraft, watercraft, robotics, medical devices, weapons, and others.

(Reference: http://en.wikipedia.org/wiki/Mechanical_engineering)

Mechanical engineers at Rotor Clip design machines and equipment used for the company to produce retaining rings using the CAD program Solid Works. They are responsible for die design, used for stamping retaining rings from coils of steel, working with customers on technical related problems and questions, and building machines to help produce retaining rings to the appropriate specifications. Mechanical Engineers also repair and maintain already existing equipment, as well as research new methods and materials for processing retaining rings. Rotor Clip engineers also troubleshoot, maintain, and repair equipment.

Job Title: Mechanical/Design Engineer

Education: BS in Mechanical Engineering

Qualifications:

- At least a bachelor's degree
- Basic understanding of how to read technical drawings
- Basic understanding of CAD programs
- Understanding core concepts including mechanics, kinematics, thermodynamics, materials science, structural analysis and electricity

Duties:

- Design retaining rings to certain specifications
- Design new ways to process or create retaining rings
- Assist with repairing existing machines

Rotor Clip Opens its Doors

*I*n September 1957 Bob Slass opened a small company on Allen Boulevard in Farmingdale, New York, making the same type of retaining rings he had schooled himself on in previous jobs. It was a time for [entrepreneurs](#) to shine in those post war years. But despite their exuberance, starting a new business was no guarantee of success. The marketplace was a stern task master and many small businesses like Bob's failed.

*“Son, I couldn't buy these
for the love of money.”*

Rotor Clip opened its doors in 1957. The building consisted of 2,000 square feet and was located in Farmingdale, New York.





ROTOR CLIP COMPANY

114 ALLEN BOULEVARD,
FARMINGDALE, N.Y.
MYrie 4-0400

PRICE LIST
EFFECTIVE: JANUARY 1, 1958
FORM RC-01

"SH" SERIES (BULK PACKAGED)

ROTOR CLIPS..

MATERIAL: h.c. Steel
Sizes 12,15,18 in BeCu
FINISH: oil dip
THICKNESS: standard

PRICE PER 1000 PIECES								
RING SIZE	PRICE PER RING	100 -499	500 -999	1000 -4999	5000 -9999	10,000 -24,999	25,000 -49,999	50,000 -99,999
12	\$.04	\$15.15	\$12.05	\$10.00	\$ 8.50	\$ 7.65	\$ 6.65	\$ 6.05
15	.04	15.60	12.45	10.30	8.80	7.85	6.85	6.25
18	.04	17.10	13.65	11.30	9.60	8.60	7.50	6.85
25	.03	14.55	11.60	9.60	8.15	7.25	6.35	5.80
31	.03	15.00	12.00	9.90	8.40	7.45	6.60	6.00
37	.04	15.50	12.35	10.20	8.65	7.75	6.80	6.15
43	.04	15.90	12.65	10.45	8.90	7.95	6.95	6.35
46	.04	16.00	12.80	10.60	9.00	8.00	7.05	6.40
50	.04	17.70	14.15	11.70	9.90	8.85	7.80	7.05
56	.04	18.85	15.00	12.45	10.60	9.45	8.30	7.50
62	.04	19.90	15.90	13.15	11.10	9.95	8.80	7.95
68	.04	21.45	17.15	14.20	12.05	10.70	9.45	8.60
75	.05	23.05	18.45	15.20	23.95	11.50	10.20	9.20
81	.05	24.60	19.65	16.20	13.75	12.35	10.85	9.80
87	.06	26.00	20.75	17.15	14.55	13.00	11.45	10.40
100	.06	29.10	23.25	19.25	16.30	14.55	12.80	11.65
112	.07	35.20	28.15	23.10	19.65	17.95	15.70	14.20
125	.07	38.40	30.90	25.00	21.40	19.45	17.50	15.90
137	.08	41.70	33.65	26.85	23.10	21.20	19.20	17.50
150	.09	44.90	36.30	28.70	24.85	22.90	21.05	19.10
162	.11	58.50	47.50	37.50	32.50	30.00	27.50	25.00
175	.13	65.25	52.75	41.75	36.25	33.25	30.50	27.75
200	.16	79.00	63.50	50.00	43.50	40.00	36.75	33.50
225	.23	114.00	93.00	72.00	73.50	58.00	52.75	---
250	.26	131.00	107.00	83.00	73.00	66.75	60.75	---

PAGE 4

AUTOMOTIVE
REFRIGERATION
APPLIANCES
HYDRAULICS
AERONAUTICS
ELECTRONICS
ELECTRICAL
EQUIPMENT
MACHINERY

PAGE	
1	E SERIES (UNSTACKED)
2	E SERIES (STACKED)
3	HO SERIES
4	SH SERIES
5	Plating Charge

*First Rotor Clip price list,
January 1, 1958.*

Rotor Clip Opens its Doors



In fact, Allen Boulevard in those days was given the dubious title of “Bankruptcy Alley,” a fitting description given 1957 was also the year the doomed Ford Edsel was introduced to a less-than-adoring public. As Bob noted in 1987, “These were very small buildings. People who rented them by and large failed.”

But Bob was no newcomer to the retaining ring industry as previously noted. He spent several years learning and understanding the business. When Bob opened Rotor Clip in 1957, he was ready as an engineer, a tool maker, a machine operator and a business man to make a success of his fledgling company that occupied a mere 2,000 square feet at the time. (“It was like one large living room,” Bob recalled).

Despite the success it achieved, Rotor Clip was by no means a fairy tale story. Bob had little money to invest. To help make ends meet, he took a part time job in St Louis, Missouri, flying there once a week to provide engineering expertise to a start-up company.

He often purchased used equipment and machinery and refurbished it himself at little or no cost. It was also difficult to hire the talent he needed so Bob wore many hats, designing and building dies, processing parts and handling all other aspects of the business. (His sister, Dotty, recalls how his mother and aunt often took time to help him in whatever capacity he needed).

“We had one small press and a couple of machine tools and a tumbler. That’s how we started making retaining rings,” he said. “I made six, single cavity E-ring dies and started out trying to sell the rings these made.”

Bob “engineered” his sales trips, so they could be accomplished efficiently and with very little outlay of money.

“I went out in an automobile with \$90 in my pocket,” he recalled, “with the intention of sleeping in the car and selling retaining rings.”

The hard work paid off. “Our first customer was Eaton Heater Division in Cleveland, Ohio,” Bob said where his first orders were for E type retaining rings. Others soon followed in the Cleveland area including TRW and the most successful customer at the time, Chevrolet Division.

“They made transmissions at this Chevy Division and were very glad to find another source for retaining rings,” Bob recalled. According to the buyer, his current supplier’s work force had gone on strike cutting off deliveries of retaining rings.

“He told me, ‘Son, I couldn’t buy these rings for love of money,’” Bob said of their conversation. “Then he shook my hand and gave me an order.”

There were long years of hard work and losses, as well as doubts as to whether or not Rotor Clip would survive the more established competition in the industry. But the country was changing. When Rotor Clip opened its doors in 1957, middle income earners made up 49.9% of income received by US families, outpacing the income of the top 20% by the largest margin to date.

After a sharp recession in 1958 Congress passed the Federal Aid Highway Act in April of that year. This implemented President Dwight D. Eisenhower’s vision of connecting America with a network of super highways. The act also created jobs and provided a much needed stimulus for the economy.

By 1959 steel output reached a record 64.2 million tons. The pent up demand of America’s middle class for homes, automobiles and appliances was about to explode, creating an unprecedented demand for retaining rings.

Rotor Clip was about to abandon its bankruptcy alley roots in search of a larger, more suitable facility.

DON BATSON REMEMBERS BOB SLASS

Rotor Clip Opens its Doors



The Eaton Heater Division in Cleveland, Ohio, was Rotor Clip's first customer for retaining rings in the late 1950's. This ad, which appeared in Life magazine, is promoting the company's line of automobile air conditioners.

FORGET the HEAT!



*Drive cool... arrive refreshed
with an*

EATON CAR AIR CONDITIONER

Forget the sizzling sun, soaked shirts, sneezes and snarls. With an Eaton Car Air Conditioner you ride in clean, cool, spring-fresh air — free from pollen, dust, and annoying traffic clamor. In the slimmest new case — chromium and satin black — the Eaton fits snugly up under the dash with plenty of leg room. Cooling is quick and quiet. Air volume and direction controls are at your fingertips. Temperature is automatically controlled. No matter how blistering it is outside you feel better, drive more alertly, arrive refreshed with an Eaton Car Air Conditioner . . . built and backed by the world's largest independent maker of car air conditioners.

CHECK BELOW FOR YOUR NEAREST EATON SALES AND SERVICE CENTER

ILLINOIS

Chicago

Aetna Truck Parts
2100 Wabash Ave.

The Harry Alter Co., Inc.
2399 S. Archer St.

Auto Electric Serv. & Supply, Inc.
5858 Broadway

Sievert Electric Co., Inc.
1333-51 Bauwauas St.

Supreme Radio & TV Refrig. Serv.
6148 Irving Park

T&T Carburetor & Elec. Service
3616 N. Cicero Ave.

Peoria

Walker & Werner
207 Fayette St.

MICHIGAN

Battle Creek

Kool Olds, Inc.
94 Main St.

Detroit

Jefferson Chevrolet Co.
2130 E. Jefferson Ave.

Ferndale

Radiator Service Co.
1336 W. 8 Mile Rd.

Flint

Colberg Radiator Service
4012 N. Dort Hwy.

Grand Rapids

A to Z Auto Radiator
633 Division St., South

Pontiac

Pike Radiator Service
403 E. Pike St.

OHIO

Akron

Hopkins & Kipp Auto Elec., Inc.
350 W. Bowery St.

Ray Karg & Sons
2265 W. Market St.

Katvington Auto Electric, Inc.
Newton and Darrow Rd.

Cleveland

Brookpark Radiator Service
1907 Brookpark Rd.

Hasek Auto Radiator Co.
351 East 131st St.

Parts, Inc.

2401 Carnegie Ave.

Power Brake Serv. & Equip. Co.
1307 Carnegie Ave.

Dayton

Grismer Tire Sales Co.
900 S. Perry St.

Findlay

Findlay Radiator Service
601 N. Main St.

Mansfield

Ned Fort Auto Electric
118 Park Ave., East

Toledo

The Toledo Radiator & Glass Co.
2941 Monroe St. (at Detroit Ave.)

Toledo #5 Pure Stop
Exit #5 — Ohio Turnpike

Walt's Auto Glass, Inc.
7 S. Superior St.

WISCONSIN

Kenosha

Gordon Auto Replacement, Inc.
2801 Roosevelt Road



HEATER DIVISION

EATON MANUFACTURING COMPANY
Cleveland, Ohio 44104



BOB SLASS AND THE “GARAGE ENTREPRENEURS”

*R*obert Slass started Rotor Clip Company in 1957 in a small, 2000 square foot facility in Farmingdale, New York.

“It was like a large living room,” he would say with a smile, as he spoke of those days.

He bought used equipment and refurbished it. He bought broken stamping presses and made one good one, using parts from the other machines.

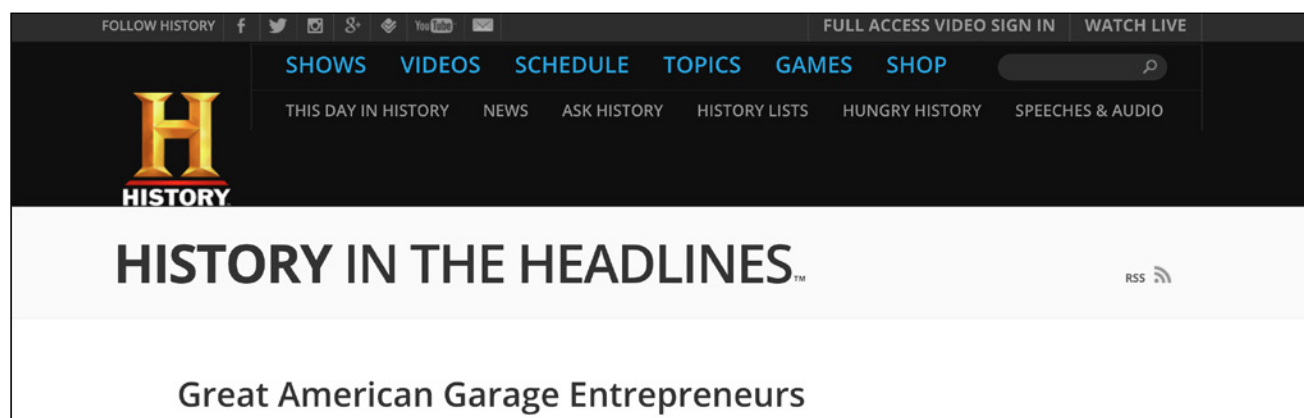
He experimented with ways to produce retaining rings from a strip of steel with as little waste as possible, which significantly reduced costs to the customer.

Today, the company he founded occupies over 238,000 square feet and services a variety of companies in North America, Europe and Asia with tapered, constant section and spiral retaining rings, wave springs and self-compensating hose clamps.

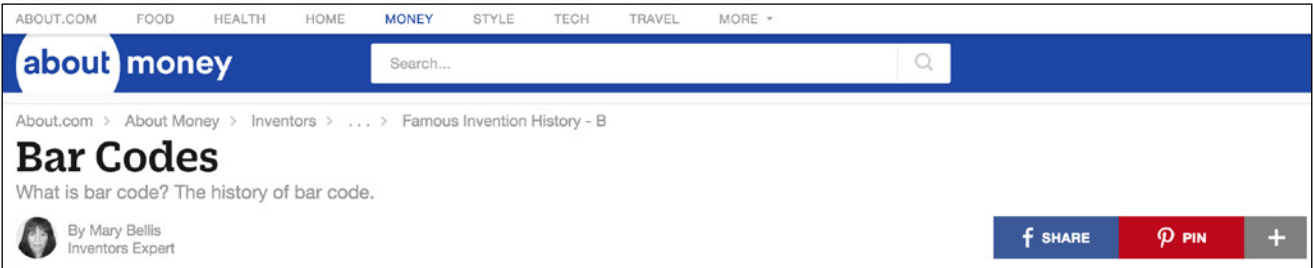
“There were a lot of guys like me who started businesses in their garages and American corporations would buy from them,” Bob recalled one day. These small spaces were hotbeds of innovation after World War II, where ideas could be tried and perfected with a minimum amount of investment. Eventually, some of these companies, like Rotor Clip, became leaders in their industries.

SOME NOTABLE EXAMPLES

The roots of HP were nurtured in a garage in Palo Alto, California, with Bill Hewlett and David Packard scraping together an initial investment of \$538 in 1939. By 1966 HP entered the computer market and is now one of the world’s largest technology corporations. (The one-car garage where it all began is a designated California historic landmark).



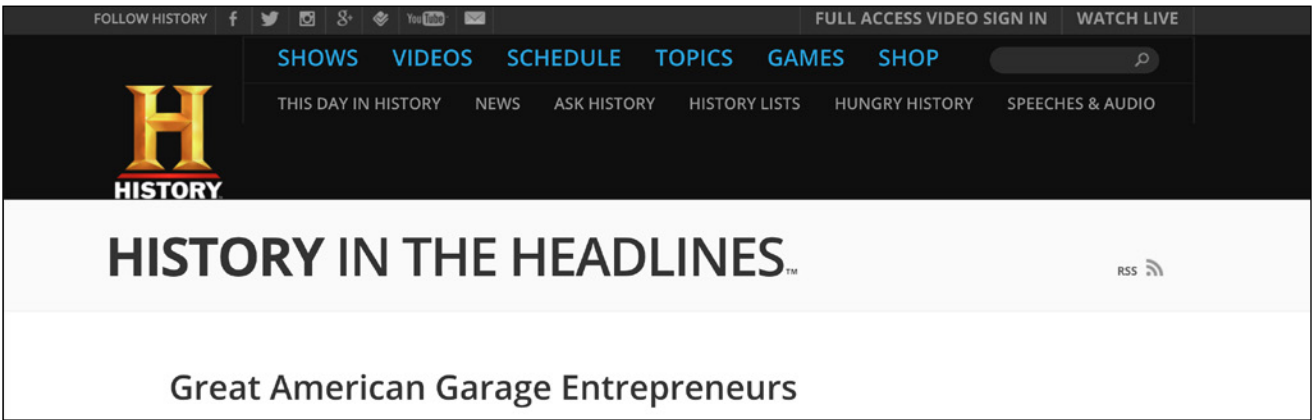
Bernard Silver and N. Joseph Woodland were graduate students at the Drexel Institute of Technology in Philadelphia, Pennsylvania, in the late 1940's. They got involved in a project proposed by a local grocer to invent a way to encode product data so supermarket items could be automatically checked out. Woodland spent time on the beach at his grandparent's home in Miami Beach, Florida, drawing shapes in the sand that would form the basis of a graphic version of the Morse code he had learned as a boy scout. He and Silver patented the idea in the early 1950's, and sold it eventually for \$15,000, not realizing that it would someday evolve into the bar codes that would be used on virtually every product.



In 1956, Bette Nesmith Graham of Dallas, Texas, was working as a secretary in an office. She wanted to find a better way to correct typing errors, so she invented a liquid that you could use to “paint” over the mistake, then re-type the correct letter(s). The color of the liquid matched the paper, so the error was often undetectable. Demand for the product she called “Liquid Paper” increased to the point where she turned her kitchen into a laboratory, mixing up product with her electric mixer. Graham’s son, Michael Nesmith (later of “The Monkees” fame), and his friends filled bottles for her customers. Years later, she sold her company for \$47 Million.



Ruth and Elliot Handler started making picture frames in their California garage. They took the scraps of wood and made furniture for doll houses. That garage experience eventually led to their most successful product under the company name “Mattel”: the famous “Barbie” and “Ken” dolls.



Bob Slass and the "Garage Entrepreneurs"



Entrepreneurs like Bob Slass have always been at the heart of any successful economy. Merriam-Webster dictionary defines an entrepreneur as "...one who organizes, manages, and assumes the risks of a business or enterprise." This risk-taking characteristic leads to technological breakthroughs that benefit people in the form of improved products and services.

Entrepreneurial risk taking has its roots in the industrial revolution in both Great Britain and America. Early industrial entrepreneurs dared to believe things could change, that they could improve people's lives through their ideas and inventions and make the world a better place to live. Prior to this, people were fatalistic; they believed you were stuck with the hand you were dealt and there wasn't much you could do about it.

But early entrepreneurs set their sights on problems and through dogged determination solved them. For example, James Watt didn't invent the steam engine; he solved the problems of these first models. He eliminated the need to cool the piston in order to retract it after the steam drove it forward, greatly saving energy and costs. He also invented the concentric bearing which applied the power of the engine to the shaft in a circular direction. Machinery could now be hooked up to this rotating power source using belts, revolu-

tionizing factory efficiencies and output.

Similarly, Thomas A. Edison didn't invent the light bulb; he solved the problems of the earlier versions. He was relentless in his pursuit of a filament that would last long enough to make the light bulb practical for consumer use. After countless hours of experimentation, he settled on a tungsten material coated in carbide. He also created a vacuum on the inside of the bulb which added to its life. We can only imagine how mesmerized the crowd was that came to his Menlo Park, New Jersey, lab in December 1879. There they saw light bulbs that could burn for hours and give off light without the smells and dangers associated with other light sources in use at the time like candles and kerosene lamps.

When others encounter problems and proclaim, "There's nothing more we can do," and "That's just the way it is," that's where the entrepreneur's work begins. They refuse to accept limitations or give up on an idea though it may take years to refine. From perfecting a longer-lasting light bulb, to improving the design and efficiencies of retaining rings, entrepreneurs all over the world apply their skills to the relentless pursuit of solving problems.

And the rest of us are the chief beneficiaries of their efforts.

GO BACK

Bob Slass and the "Garage Entrepreneurs"



A HURRICANE STARTS A NEW CAREER —DON BATSON

I first met Bob Slass when I was the general manager of the Lone Star steak house in Bridgewater, New Jersey. Bob and Gloria and another couple would come in Friday nights during Rotor Clip's shift change. He was a difficult customer, complaining about the AC being too cold, it was too warm, or the fans above were blowing too much, OR THE MUSIC WAS TOO LOUD. He was very demanding, but fair; he knew what he wanted and he got it.



Don Batson

to keep their eyes on it for me.

"I'll get you to work, Don, because we want to eat there later," he says. "So get that restaurant open."

Through conversations with Jonathan, I learned about Rotor Clip. One day, Jonathan said, "Hey, if you ever get tired of this, let me know."

So one day I finally said, "Jonathan, I have had it here." Right on the spot, he invited me to come to Rotor Clip and work for him. I gave notice and started working at Rotor Clip

I got to know them pretty well. In talking with them I learned about the factory. They would always be asking me questions about things. Eventually I would meet his sons, Jonathan and Craig.

In September 1999, a hurricane hit. The hurricane came through and messed up the traffic really bad, I-287 especially. I needed to be at work by 10a.m. so I turned my car around and got my bike from my house. I rode through the back roads and I eventually I come to Davidson Avenue and there is the factory.

I pass by and cross the bridge and a car just slams on its brakes, a white Cadillac, stopping traffic on both sides of the road. The window rolls down and its Bob and he yells out, "Don is that you?!" I said, "Oh, hey, Mr. Slass I am trying to get to work." Mind you, both sides are stopped and we are just carrying on a conversation with cars honking their horns.

Finally, he has me ride my bike back to the factory. He pulls in and tells me to put the bike down and told some guys

in December 1999.

Bob would ride his scooter around the factory, stopping occasionally to have conversations with some of the employees. He went everywhere with that scooter. You never knew when he would turn up; you would turn around and there he was. Some people would tell him what they thought he wanted to hear, but I would always give it to him straight. I think he appreciated it. I knew he wasn't going to get mad; I would just say something wasn't working, and he would say, "Okay let's fix it".

Bob knew everything. He didn't even have to be here, he just knew it. He was focused. He observed everything and nothing was a surprise to him.

I'm grateful to that hurricane; it was the start of my career here at Rotor Clip.

GO BACK



Rotor Clip Moves to the Bronx

“Glory, Glory and Halleluiah”



Rotor Clip moved to a larger facility in the Bronx, New York, in 1962. There were three buildings on the ground nicknamed, “Glory, Glory and Halleluiah.”

No one noticed Bob Slass and his tiny caravan of vehicles winding its way from Allen Boulevard, Farmingdale, to Randall Avenue in the Bronx in July 1962. They were probably too busy listening to the Hollywood Argyles sing their top 10 hit “Alley-Oop,” or watching Elvis Presley gyrate his elastic hips to “Stuck on You.” But years later this seemingly minor event would gain the attention of an entire industry.

“We needed more space,” Bob recalled.

Also, since his main competition was in Long Island City, and Rotor Clip was a trucking zone further, he was paying more money to ship his parts.

After shopping around, Bob found a location in the Bronx, New York, where he had room to grow and the chance to save money on trucking expenses to his automotive customers in the Midwest.



Bob also added a staff consisting of a handful of people to help with the manufacturing and office duties. Among them was Evelyn Brodsky, who joined Bob in October 1961. Evelyn was able to help Bob balance Rotor Clip's business demands with his need to fine tune engineering and production techniques in order to meet customer requirements.

"Bob's interest and greatest talent were in engineering," she recalled. "He always put a maximum effort into producing the tools needed to make our rings." Evelyn also recalled how the staff ate meatball sandwiches and franks for lunch, frequented Moshman's Bakery on 163rd street, and worked hard to make Rotor Clip a main player in the retaining ring marketplace.

As the years passed, [Evelyn Brodsky](#) grew to become one of Bob's most trusted and valuable employees until her retirement in 1998.

The new Rotor Clip facility eventually encompassed three buildings. Referred to as "Glory, Glory and Halleluiah," one was used for production (tool room, press room, stacking), another for heat treating and the third one, for plating.

It was a time for experimenting and refining processes and Bob proved he was ahead of his time with the concept of continuous improvement, espoused by the Japanese automotive industry and later by their American counterparts. Vincent Rodgers, an employee who worked with Bob back then, remembers some of the improvements that were part of everyday life at Rotor Clip.

"Bob used to get gallon paint cans, and modify them so that we could plate retaining rings in them," Vincent recalls. "They were placed on a machine that Bob built on a sort of cam that shook them, which accomplished the plating process in a most unique way."

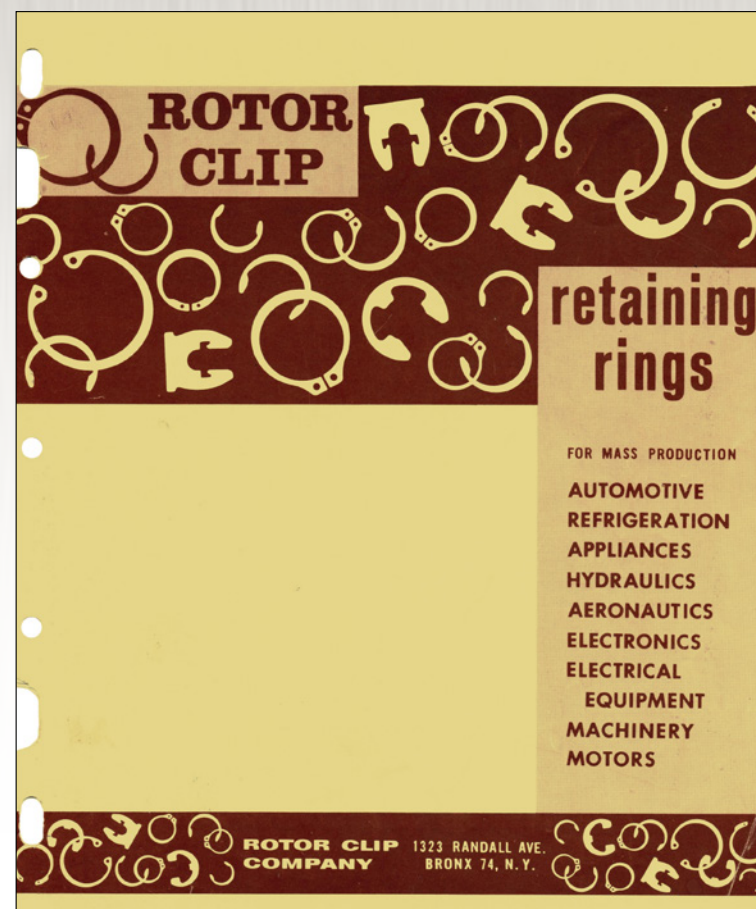
Bob was adept at buying used presses and fixing them. Vincent remembers the time Bob purchased a used 75 ton stamping press and taught him how to "scrape" the bearings so that it could be put into service.

Then there was the customer who wanted to eliminate tangled rings so that they would be easier to handle. (Internal rings could be like fish hooks, often tangling when placed loose in a box). Bob figured a way to capture the rings on a plastic tube with end caps, making a neat stack of the rings and solving the customer's problem.

During those years in the Bronx Bob began perfecting his unique die designs that resulted in the most efficient

yield of retaining rings from a strip of steel. For example, he modified the E ring dies so that instead of having a one row die, there would be four or five rows significantly increasing production.

One time, Bob noticed that making an SH-125 (a 1 ¼ inch ring in diameter), usually resulted in a large piece of scrap in the center after the ring was stamped out. Vincent



The first Rotor Clip catalog published in 1962.

recalls how Bob had him put the die in, and then install the SHR-62 die as well.

"He fed the coil in and the press stamped out the SHR-62 ring in the center," Vincent said. "Then the SH-125 die stamped out the ring with the remaining material, which really reduced the scrap and increased our production." This simple experiment was the start of the "rings within rings" concept that was Bob's signature work.

He used the same concept on an HO-244 ring, Vincent recalled.

"After the coil ran out, Bob had us re-band it and then run it backwards so it could use up all that scrap."

During the 1960's the use of retaining rings increased as engineers sought to reduce costs in the assemblies they designed. This was particularly true in the automotive industry

GERALD LEBOFF REMEMBERS BOB SLASS

Rotor Clip Moves to the Bronx



where competition was heating up. In addition, the Clean Air Act of 1963 and the Vehicle Air Pollution and Control Act of 1965 mandated emissions and pollution controls; the National Traffic Motor and Safety Act passed in 1966 required safety regulations for all vehicles such as front shoulder seatbelts for passengers, and shock absorbing steering columns. These regulations required streamlining assemblies

and reducing weight in order to assure compliance and retaining rings became a fastening staple in many moving parts including engines, transmissions, steering gears, air conditioning compressors and brake systems.

Bob's production methods and attention to quality was rapidly gaining Rotor Clip the reputation it would enjoy in the years to come.

“ Evelyn Brodsky, one of Bob's first hires when he moved to the Bronx. She used to say how she could hear the sound of the stamping presses through the wall of the Bronx building. When the company moved to its current facility in Somerset, New Jersey, the sound of the press room was barely audible. *“I couldn't cope with that,”* she later recalled. ”



Rotor Clip Moves to the Bronx



EVELYN BRODSKY

AKA Mrs. Miller

by Joe Cappello

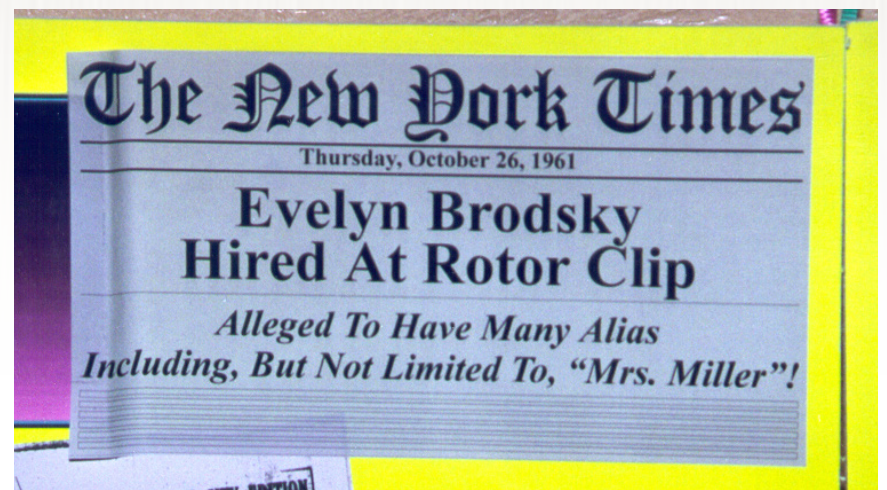
Evelyn Brodsky was the first person I met in 1982 when I came to Rotor Clip looking for a job. I was impressed by her devotion to Bob and Rotor Clip as well as her unique brand of charm and wit (“Do you cheat on your wife?” a question which was always followed up by, “Do you lie?”).

She often referred to herself as “Mrs. Miller,” an alias that she playfully used to deflect unwanted calls and to use as a contact name when running help wanted ads in local newspapers. But when it came to servicing Rotor Clip customers, she was all business, taking the time to help one meet an emergency or another get the technical help he needed for a particular job.

As one of our sales reps noted after her death in 2000, “...she knew more about retaining rings than most engineers,” but also “possessed a much higher quality...a far more profound understanding of the heart.” Evelyn was Bob’s closest advisor. “Her countenance and wisdom,” the rep continued “was profound for our ‘skipper’ at Rotor Clip as she was his ‘navigator’ and kept the company and crew on a steady course.”

You could always talk to Evelyn about work, your life, or just about any issue under the sun. My memories of Rotor Clip will always be linked to Evelyn and I am grateful for all she did for me during my early years with the company.

I invite you to view some of my favorite Evelyn photos and memorabilia.



Evelyn officially became a Rotor Clipper on October 26, 1961.



This “All the Roads Lead to Rotor Clip” sign hung near Evelyn’s desk for many years.

GO BACK





Evelyn with Bob Slass at Rotor Clip headquarters in Somerset, New Jersey.



Bob and Evelyn at her retirement party in 1999.



“Best Wishes, Mrs. Miller,” was the inscription on Evelyn’s cake in honor of her retirement. She often used this name as an alias for help wanted ads she ran in the local newspapers.



Evelyn at one of the many Rotor Clip Holiday parties she attended over the years.



Evelyn with her husband, Murray. She often referred to the aisle that ran between the presses in the press room as “5th Avenue.”



Evelyn with a fellow employee who also worked for Bob in the Bronx, Eddie Nelson.

EVELYN BRODSKY



2 FRIENDS

find common ground

erald LeBoff sits comfortably in his apartment overlooking the Hudson River. It is almost evening but you can still see the shore below as it winds past a wooded area. He points out a path in the middle of the trees and traces the two mile walk he takes each day to stay fit.

After settling into a comfortable chair in the spacious living room, Gerald recounts his friendship with Bob Slass, and the time they shared together during their respective trips to Florida. Having been the Chief Executive Officer of a cold heading company that made screws, nuts, and bolts, Gerald recalls talking to Bob about eutectic mixtures. It was a technical term referring to the temperature of a mixture of substances that gives the lowest temperature at which the mixture becomes fully molten.

“Where did you learn that?” Bob asked. He wasn’t easily impressed, yet Gerald’s knowledge of the technical aspects of his company put them on common ground.

“I could speak his language,” Gerald says. He found that he had a lot in common with Bob and as a result, “We became friends.”

As Gerald learned more about Rotor Clip, he understood that this was more than a business to Bob; it was his passion. As Gerald saw it, Bob’s Rotor Clip was his story, one that he created and told with each process he improved and

innovation he introduced. Given Rotor Clip’s global presence, that story continues today as a living tribute to Bob Slass and the company he established.

When Bob planned to move Rotor Clip to Somerset, New Jersey, in the late 1960’s, he looked around for a suitable building design. Gerald recounts how Bob and his wife, Gloria, traveled to Chicago to look at other factories for ideas. The structure he ultimately built consisted of glass windows and steel I beams based on the classic designs of the German American architect, Mies van der Rohe.

“He fashioned the building after himself, but he also fashioned it after German Expressionistic art,” Gerald said. “It was simple and he was able to connect buildings (the first floor of one to the second floor of the other) with the same kind of architecture.”

As their relationship progressed, Bob confided in Gerald about his youth and particularly his father. He was a major influence in his life urging him to go to medical school to become a doctor. But after two years of such training, Bob gave it up for his true passion: engineering.

Gerald added that Bob’s vision of Rotor Clip’s future was embodied in his sons, Jonathan and Craig. He recognized their individual skills (Jonathan in engineering, Craig in sales) and knew they would be a good fit for running the business.

“He thought that the combination of the two could be tremendous provided that they coordinated and worked together,” Gerald concluded.

GO BACK



Manufacturing *Career* Focus

Technical Knowledge and Support for New and Existing Products

TECHNICAL SALES

Technical Sales is the bringing together of sales and engineering. They do work on both sides of this spectrum, from technical knowledge of a product to applying it to selling the product. Selling products in this market is based more on technical information and problem-solving aimed at convincing a potential buyer to make the next step in buying the product. They also give help and support on the more technical side of what a company makes.

(Reference: http://en.wikipedia.org/wiki/Sales_engineering)

Technical Sales at Rotor Clip Company is a combination of knowledge between sales and mechanical engineering. They are in charge of customer support for buyers who want more technical knowledge of the product. They handle special pricing and quotations for customers who are interested in special requests and are in charge of over-seeing these quotations until completion. They have knowledge on different metals used and specific processes needed (tumbling or different coats?...) to bring retaining rings to their final stage.

Job Title: Technical Sales

Education: BS in (?)

Qualifications:

- At least a bachelor's degree
- Basic understanding of how to read technical drawings
- Understanding of how to apply parts of engineering to sales
- Knowledge of different metals used in retaining rings

Duties:

- Helping and providing support for customers or potential buyers with more technical questions
- Calculating special pricing for customers who request certain parts
- Oversee completion of quoted parts

Salary:

- Full time, starting salary ranges from \$44,000 to \$60,000



Rotor Clip Meets the Challenges of a Changing Economy

"Go build a building."

Rotor Clip paralleled the economic success America was enjoying in the 1960's. At that time America was the major producer of industrial products and the rest of the world was its market. Retaining rings continued to shine as the low cost, effective fastener of choice, and Rotor Clip was rapidly becoming the recognized quality supplier of these items.

Once again, Rotor Clip was experiencing growing pains and Bob began looking for a new home for his expanding company. He settled on a parcel of land in Somerset, a rural farm area in Central New Jersey that would become a major business and industrial hub of the Garden State in the years to come. But what should Rotor Clip's new home look like?

As was typical of Bob, he began to research buildings to determine the best style for the new factory. His wife, Gloria,

recalled how they would spend time looking at building designs.

"On a Sunday afternoon, we packed the kids in the wagon and rode around Westchester County, New York, looking at buildings," she recalled. "A year and a half of our lives was spent this way."

After studying a variety of architectural styles, Bob settled on the design approach of famed architect Ludwig Mies van der Rohe, a German-American who was regarded as one of the pioneering masters of modern architecture. Mies' clear and simple approach to buildings was compatible with Bob's vision of how a factory should function on the inside. (http://en.wikipedia.org/wiki/Ludwig_Mies_van_der_Rohe). The only issue left to resolve was who should build Rotor Clip's new home.



Bob recalls speaking to his accountant about which contractor to choose for the job.

"Can you build it?" Bob recalled his accountant asking.

"Well, I built a garage once," Bob said.

"Can you build this building?" the accountant repeated.

"I think I can," Bob replied.

"Then go build it," he said.

Bob designed the building and served as part of the construction crew he had hired to help him accomplish the task. Bob began work on the site in 1971 and in 1972 the building was complete and Rotor Clip moved from the Bronx to its new location.

While Rotor Clip was busy establishing itself in the New Jersey countryside, other events that were to have significant impact on manufacturing in the U.S. were occurring. In 1968 Nissan introduced the Datsun P510 to the American market. It soon changed the perception of Japan as a shoddy producer of industrial goods. (http://en.wikipedia.org/wiki/Datsun_510).

In 1969, Toyota, another Japanese newcomer, reportedly sold 127,000 cars in America.

Economic events took a downturn in 1973 as the Arab Oil Embargo, put in effect by the Organization of Arab Petroleum Exporting Countries (OPEC), sent oil prices soaring from \$3 a barrel to \$12 a barrel by 1974 (http://en.wikipedia.org/wiki/1973_oil_crisis). The days of cheap gasoline at the pump that Americans had enjoyed for decades came rapidly to an end.

In 1975 the U.S. government issued Corporate Average Fuel Economy standards as part of the Energy Policy and Conservation Act, in response to fuel efficiency needs in the wake of the Arab Embargo. These new standards were scheduled to take effect in 1978.

In the meantime Japanese carmakers like Toyota, Nissan and Honda responded with smaller, more fuel efficient cars to cope with the fuel price increases. Domestic auto makers responded to the rise in these imports with more compact style cars such as the Ford Pinto, Maverick, the AMC Gremlin, the Chevy Vega, and the Hornet.

Rotor Clip Meets the Challenges of a Changing Economy



Bob Slass at work in 1971 on what would become Rotor Clip's global headquarters in Somerset, New Jersey. Bob designed and built the building himself with the help of his own crew.



A young Jonathan Slass surveys Rotor Clip's progress from atop his mom's shoulders.





The land for the building was a parcel of former farmland in Central New Jersey. It bordered the then new Route 287, which would become a popular truck shipping route for Rotor Clip products.



The crew joins one of several steel I-beams used in the construction of the first Rotor Clip building in 1971.

Political events became volatile once again, this time in Iran. This resulted in a second spike in energy prices and the 1979 Energy Crisis. The rising popularity of small cars from the Japanese imports took its toll on Chrysler, which required a controversial \$1.5 billion loan guarantee from the U.S. government in order to stay afloat.

Bob watched world events with a cautious eye even as his business was still growing. In 1976 he added an extension to increase production capacity in response to customer

demand. He was clearly winning the battle for market share from his domestic competitors. But Bob realized he couldn't ignore the threat from the surge in global competition.

The U.S. economy was clearly changing, and Bob now he had to adjust in order to compete in this new, volatile marketplace.

KATIE VASINDA REMEMBERS BOB SLASS

Rotor Clip Meets the Challenges of a Changing Economy



BOB REALLY MADE IT FUN TO WORK IN HIS COMPANY

Katie Vasinda

When I first came here I was afraid of him (Bob), but the Slass family has always been good to me; Bob was good to me.

Anytime you had a problem with him you could go and talk to the man. He would listen to any ideas you had. Anything...he never judged you.

Bob always had a smile for me. He was a very decent man. Even if he was busy or not in the mood and you needed to talk, he would make the time. He would help you; he did a lot of great things for scholarships and getting kids through school and other financial things if you needed it.

Bob was very good to his employees. We had picnics; we got T-shirts and a bonus every Christmas. He would go around the different departments, ask how they were doing, if they needed anything. He was for the employees. He really looked out for us. If any family member needed help, he would help. He never turned his back on anyone.

But that doesn't mean he was an easy mark. You couldn't get around Bob. He could tell if you weren't telling the truth.

9/11 hit him really hard. We had two people in New York that day and he was a wreck all week. I was in Vegas and I was stuck. It was a Tuesday. You couldn't get anything. No planes, trains, you couldn't rent a car so I had to call Bob every day to check in. He would ask how I was, if I needed money, but that's how he was.



Katie Vasinda at Rotor Clip (circa 1985).

"Are you sure?" he'd ask.

"Yeah, Bob, I'm fine," I'd tell him.

He was always interested in what people were doing. He was very hands on. Anytime he could, he was right there with you. He just watched, maybe offered a suggestion, but never got in the way.

Bob made it really fun to work for this company. He was just an all-around very nice person to work for, and I will never forget him.

US Automotive Responds

“...Companies should be in business for the long term to compete successfully and provide jobs. To do this, constant improvement is necessary.”
Turning Deming’s Points into Action, by Robert Slass, Industry Week, June 20, 1988

The 1980’s saw the rise of Japan as an economic powerhouse and an innovator of products and services. They perfected methods of production and succeeded in manufacturing quality goods at very competitive prices. This gave Japanese companies a strong advantage in selling everything from automobiles to consumer electronics. Many industries that enjoyed sole domination of their respective markets for many years were suddenly scrambling to stay in business.

JAPAN BUBBLE

It was no surprise that in 1981 Japan entered into a voluntary agreement with the US government to limit cars sold in this country to 1.68 million per year. This didn’t stop them from building automotive plants throughout the US and tak-

ing significant market share from the traditional “Big 3” of US car manufacturing: GM, Ford and Chrysler.

Bob watched these events with great concern. He was particularly troubled by companies that had been in business for a lifetime suddenly selling out or dissolving into bankruptcies. If Rotor Clip was to avoid a similar fate, it had to readjust to the changing manufacturing picture.

Bob put his own improvement plan into action. He was busy tooling up many new retaining ring sizes, and it became apparent that he had to produce these tools quickly if he were to compete. In 1980 he purchased a Computer Numeric Control (CNC) vertical machining center to speed up production of the die sets that held the tools used to stamp retaining rings. These traditionally relied on the manual dexterity of toolmakers, but with a CNC machine they could now be produced with high accuracy in a much shorter time.



Bob had also heard about Wire EDM machines and their ability to produce tools made from very hard materials accurately and quickly. He invested in one in 1987 and revolutionized Rotor Clip's tool making capability overnight. The dies and punches that stamped out retaining rings could now be produced to an accuracy of .0002".

The purchase of this equipment paralleled Bob's tooling of a metric line to make metric retaining rings. He knew that the shift underway would include a demand for this standard and he wanted to be prepared for it. (Note: The U.S. is the only country that is not on metric standards).

The domestic automotive industry finally embraced the change it needed to successfully compete with its foreign rivals. In the 1980's they introduced their own quality programs designed to make their automobiles as reliable and price-competitive as their foreign counterparts. Bob immediately geared up to meet these new stringent quality requirements. He hired a graduate metallurgist and revamped the quality department. He instituted several quality practices in the plant including Statistical Process Control (SPC), a mathematical way to monitor critical characteristics of retaining rings including thickness and free diameter; computerized feeding of the heat treating furnaces; established lot traceability; and purchased a CAD system for the engineering department to design dies for ring production.

Automotive companies began to visit their suppliers' facilities to conduct periodic quality audits aimed at determining the effectiveness of their quality systems. This was unprecedented in American manufacturing and some companies resented the intrusion of their customers into the operations and practices of their factories. But Bob saw it as an opportunity to show his large automotive customers Rotor Clip's commitment to quality.

The first of these audits occurred at Rotor Clip in 1985 under the then GM SPEAR 2 program (SPEAR was an acronym for Supplier Performance and Evaluation Reporting). Earning a "Spear 2" rating meant that your company was "self-certified" i.e., parts were considered of high quality, bypassed inspection and went directly to the GM production line.

Rotor Clip passed the audit and received the certification. The letter from the GM auditor to the company read in part: "The innovations and creativity displayed by Bob and your people are truly amazing. It must be very exciting to be associated with such a fine group."

Ford introduced its "Ford Q1 Program" in 1986 with an advertising campaign slogan that assured the buyers of the



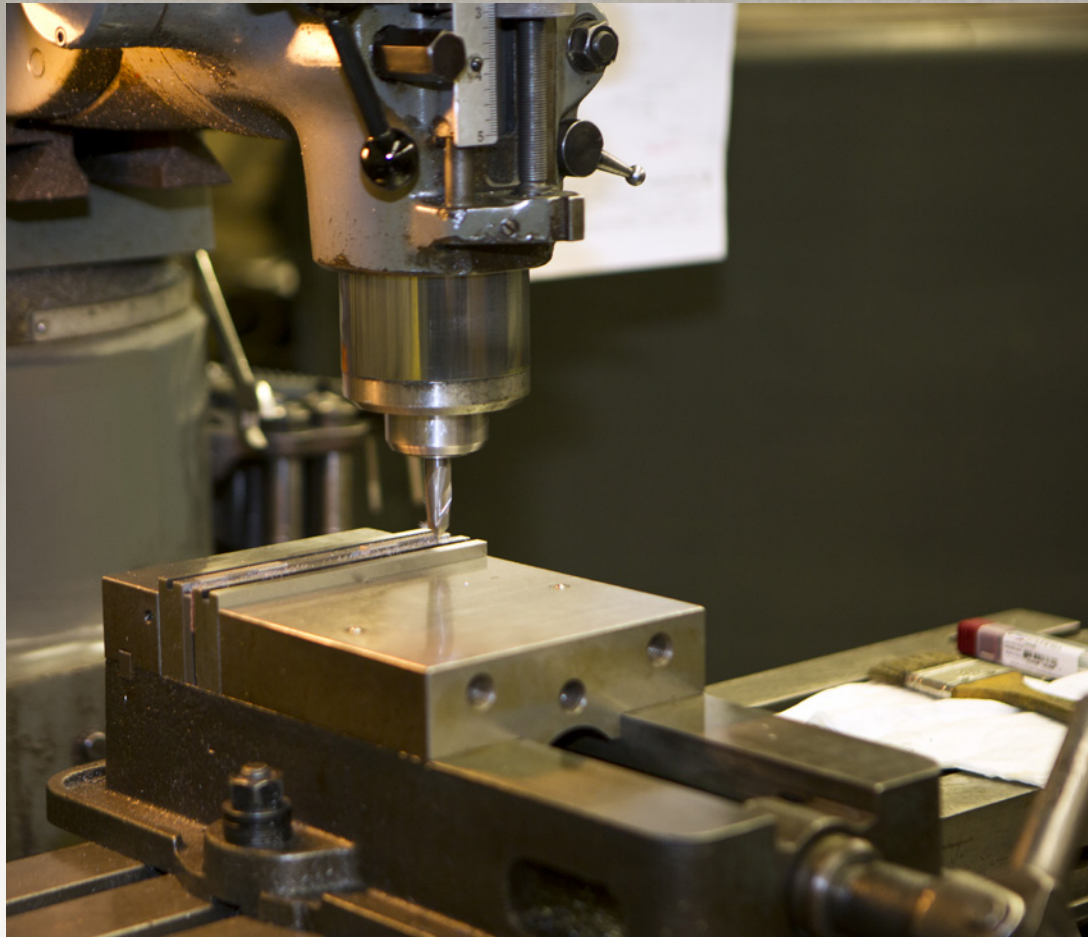
Officials from General Motors were on hand to award Rotor Clip with their prestigious "Mark of Excellence" quality award in October 1989. Bob Slass can be seen on the right holding the plaque surrounded by all 120 employees of the company at the time.



Bob Slass proudly displays a Ford Q1 award in 1986 recognizing Rotor Clip for its quality program. Rotor Clip employees also pictured are Joe Cappello (left), Director of Global Marketing, and Bruce Rudin, QA Manager.

US Automotive Responds





Rotor Clip purchased its first Computer Numeric Control (CNC) vertical machining center in 1980. This new technology at the time sped up production of the die sets that held the tools used to stamp retaining rings. (Photo by Frank Paul).



Wire EDM machines were all the rage in the 1980's for their ability to produce tools made from very hard materials accurately and quickly. Rotor Clip purchased its first in 1987 and has added several since to its tool room. (Photo by Frank Paul).

US Automotive Responds



Quality innovations in the 1980's included "in process" checking. Rotor Clip QA Manager Bruce Rudin instructs Danny Murray, a press operator at the time, how to measure the free diameter of a retaining ring with a Vernier interfaced to a computer. (Photo circa 1985. Note--Bruce Rudin and Danny Murray are still with Rotor Clip!)

quality integrity of its cars: "Quality is Job 1." The same year Rotor Clip became the 53rd recipient of the Ford Climate Division's Q1 Award, joining an elite list of only 17% of Ford vendors who had achieved the quality designation at that time.

Rotor Clip was included in a listing of these vendors in a March 12, 1986 Wall Street Journal ad taken out by Ford under the headline "Thanks for the Quality." The ad copy read in part: "The Q1 Preferred Quality Award is a special tribute to suppliers who are helping us produce the highest quality American cars and trucks."

Chrysler's QE (Quality Excellence) and Pentastar quality awards soon followed, further cementing Rotor Clip's quality reputation that would serve it well in the years to come.

US Automotive Responds



Rotor Clip Expands its Somerset, New Jersey, Headquarters

“ When our sons, Jonathan and Craig, were born, Bob often took them to Rotor Clip. He shared his world with them and they grew up with the same passion for the business that he had. ”

– Gloria Slass

Rotor Clip Bldg Designation	Square Feet	Date Completed
Building 1	39,000sq. feet	1972
Building 1 Extension	20,000sq. feet	1976
Building 1A	38,700sq. feet	2002
Building 2	44,000sq. feet	1989
Building 3	40,400sq. feet	1996
Building 4A/4B	49,000sq. feet	Purchased in 2004
Total		231,000 sq. feet (21 Hectares)



Buildings 1 and 1A

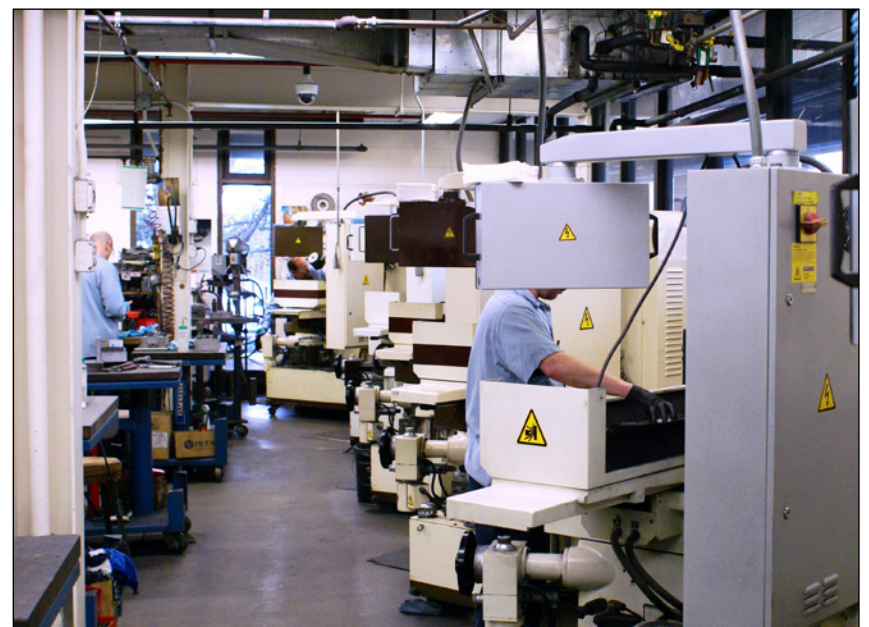


Press Room Building 1A

Bob Slass had a simple business philosophy: continuously invest in facility and equipment, and utilize technology to improve processes and meet customer demand for volume, quality products. The move to New Jersey in 1972 was in response to this philosophy as Bob sought to meet the inherent challenges that come with growth by expanding into a more suitable facility.

Rotor Clip Building 1, put up in 1972, housed all the essential parts to run the company and encompassed 39,000 square feet of office and manufacturing space. This included the tool room, stacking area, CNC/EDI room, press room as well as the shipping, warehousing, heat treating, finishing, tumbling, and plating departments. Within four years it became apparent that more space was needed to run the company and meet customer requirements. This resulted in the first extension to the existing Building 1 in 1976 of 20,000 square feet. This moved heat treating, finishing, and plating into the new part of the building, freeing up some more space to work and grow.

Another addition to Building 1 (referred to as “Building 1A”) was made in 2002 and added 38,700 square feet of



Tool Room, Building 1 (Photo by Frank Paul)

capacity. Today, this addition houses maintenance, the press room, and tool storage. The additional space created in Building 1 as a result of the expansion became home to the coiling area (used to manufacture larger retaining rings), and a special area for the production of wave springs, one and two turn spiral retaining rings and snap rings.

Rotor Clip Expands its Headquarters



Building 2



Stacking Department, Building 2

Seventeen years after Building 1 was erected, Building 2 followed encompassing 44,000 square feet in 1989. In order to expand into new areas, the business side of Rotor Clip Company got their own section of the building. Offices were made for marketing, accounting, sales, technical sales, customer service, and purchasing, along with conference rooms to conduct in-house business. This building is also used for warehousing and shipping as well as a home for the stacking department.

Building 2 was built almost entirely by Rotor Clip's own maintenance staff. The block work, tile work, and the black top road were the only things that were contracted to outside companies. Everything from the erecting of the steel I-beams to the electrical wiring and the windows was done by Rotor Clip employees.

TRIBUTE TO CHET HANDLER

Rotor Clip Expands its Headquarters



Building 3



*In-House Rolling Mill, Building 3
(Photo by Frank Paul)*

Building 3 was constructed in 1996, 24 years after construction of the first Rotor Clip building. Originally made for storage of company materials, the 40,400 square foot structure now shares warehousing duties with Building 2 and is an additional storage facility for raw materials. The company also produces self-compensating hose clamps and laser cut parts in this facility.

Building 3 also contains an in-house raw material production facility, where wire for retaining rings is annealed and shaped for ultimate forming into retaining rings in the coiling department. This enables Rotor Clip to have quicker reaction time to material requirements and allows for faster response in quality or material issues to customers.

This wire production facility yields more than 4,500 tons of formed wire per year.



Building 4



Raw Material inventory kept in Building 4

The lifeblood of Rotor Clip's manufacturing activities is the raw material on hand to meet customer demand. Rotor Clip purchased two warehouse buildings down the street from the main headquarters in 2004: Building 4A, 24,000 square feet and Building 4B, 25,000 square feet. This combined space of 49,000 square feet features an extensive inventory of raw material readily accessible to production.



An aerial view of Rotor Clip USA showing Buildings 1, 2 and 3.

Rotor Clip Expands its Headquarters





Original Rotor Clip building on Davidson Avenue in Somerset, New Jersey (1991)



The interior of Building two (circa 1989).

Rotor Clip Expands its Headquarters





Craig Slass (left) and Joe Cappello survey the work on the bridge connecting Buildings 1 and 2.

View from Building 1 showing bridge connecting the first floor with the second floor of Building 2



Bobby Pormili and John Zuchs work on supports for a bridge that will connect the first floor of the original building with the second floor of the one shown in the background.



Rotor Clip Expands its Headquarters





Jonathan Slass (left) walks down the completed bridge from Building 2 toward Building 1 with Danny Murray, Press Room Supervisor (1993).



*Building 1 A under construction.
The view is from the front of the building on Davidson Avenue. (2000).*

Rotor Clip Expands its Headquarters



In memory of CHET HANDLER

By Joe Cappello

*I*t was early summer 1984. I joined Rotor Clip in April of that year as an Advertising Director. My job was to establish an advertising and marketing communications program for Rotor Clip. I was fascinated by the array of equipment and personnel Bob Slass had assembled in the plant and remember telling him that the job wouldn't be that hard.

*"You've got a great story here, Bob.
All I have to do is tell it."*

So I always had my eyes open for something that would make a good public relations story. One day, I noticed a crane hauling a steel beam toward the empty lot behind our building. I knew there was a foundation that had been there for a while and that Bob was considering putting up another building. I turned to Chet Handler sitting next to me. He was the young mechanical engineer working on the project.

*"What's going on, Chet?"
"Just keep watching," he said. I noticed
a slight smile on his face."*

Chet was tall and lean with sandy hair and a beard and mustache to match. He and his family lived next door to Bob and his family. Chet was pursuing a degree in engineering but was having some difficulties with his studies. Bob set up a drafting board in his house and gave Chet 24 hour access to the room so that he could have a private place to study (Chet had five brothers and sisters). More importantly, Bob personally tutored Chet and helped him get his undergraduate degree in Mechanical Engineering.

The crane stopped at one of the footings and set the steel on its end. Two of our guys jumped off the crane and started bolting the piece of steel into place. They got back on the crane and headed for the garage in front of our building.

*"How many more times
are they going to do that?" I asked.
"Until all the steel for the building is up," Chet said."*



Chet Handler at the Rotor Clip Holiday Party in 1983.

He folded his arms and there was that smile again. Chet's assignment was to take the architect's design and create detailed working drawings for the building including making templates and drilling, punching or shaping the steel to accommodate window frames, doorways and other features of the structure. His preparation work was coming to fruition and you could see the pride on his face.

Within two weeks the entire steel frame for the building was up and bolted in place. (As was Rotor Clip's style, the framing of the building was accomplished by three Rotor Clip employees). Chet could now focus on his upcoming vacation. He was also looking forward to pursuing a master's degree in the fall and moving into a new apartment at the same time.

Chet went on vacation in July 1984 and never returned. He fell while hiking in the Grand Tetons in Wyoming and died at the tender age of 22. The tragedy was overwhelming for Chet's family as well as for all of us at Rotor Clip. When I think of Chet today, I don't recall the details of the tragedy that unfairly cut his life short. Rather, I see his face, smiling with satisfaction at the fine detail work he had accomplished on our new building and looking forward to the next phase of his life.

And in that one clear moment of recollection despite the passing of so many years, I know that he was happy.

GO BACK



Manufacturing *Career* Focus

Operates machinery that
punch, cut, form, chamfer, clean, weld, and assemble parts.

PRESS OPERATORS

Press operators produce parts from metal, plastic or other materials using a punch press, a computer numeric controlled (CNC) piece of equipment that makes precision cuts, grinds and punches into metal, plastic, composite or other material. Punch press operators follow blueprints or plans to make the proper specified parts. They are responsible for the machine: making sure it works at full capacity, well stocked, and performing to the highest quality.

A Rotor Clip press operator is an individual who operates and monitors the stamping press during the production of retaining rings. They must be familiar with computer assisted design (CAD) and computer aided manufacturing (CAM) technology and software. They oversee the entire operation, which includes scheduling the stamping machines, performing minor repairs, and making sure all tools are ready for use.

Job Title: Press Operator

Education:

High school diploma or general education degree (GED); six months to one year related experience or training or equivalent combination of education and experience.

Qualifications:

- Adequate communication skills – ability to read and comprehend instructions and memos, and present information to colleagues.
- Mathematical skills – press operators are required to understand complex instructions, how schematics work, and ensure items are designed and built correctly.
- Reasoning ability – understands instructions given in written, oral, or diagram form. Press operators will need to know why machines are not at peak performance, how to increase output, and how to fix errors.
- Attention to Detail - Presses are precision equipment. Being off by millimeters could be a critical error. Keen attention to detail is required.
- Mechanical and Technical Skills - Machines controlled by computers will need operators who understand CAD/CAM technology.

Duties:

- Follow safety regulations and report safety violations to management
- Lift and place incoming and outgoing parts by the work area
- Follow manufacturing procedures
- Inspect product for defects or errors
- Troubleshoot/minimal repair
- Configuring equipment, calibrating gauge settings, recognizing condition of dies, loading materials onto equipment, feeding material through die, and positioning and removing parts.



The 1990's: Gearing up to Serve the Global Market

“ Quality is a spirit and an attitude that inspires people to do better and to develop the best part of themselves in the process. ”

The Musical Side of Deming, by Craig Slass, Today's Distributor, May/June 1997

Rotor Clip's reputation in the U.S. as a high volume supplier of retaining rings to the automotive industry and the Original Equipment Marketplace (OEM) was a matter of record. If you needed high volume, quality parts delivered on time, you went to Rotor Clip.

But the next phase of expansion lay in meeting global demands for metric retaining rings. During the 1990's Bob's efforts to tool a metric line were gaining momentum. Press releases sent out by the company in 1990 announced the tooling of several retaining ring types to DIN standards including DIN 471, 472, 6799 and "Crescent" or "C" rings. He knew that the day for selling metric retaining rings in Europe was not far off and that he wanted to be ready when that day came.

Innovation and quality still dominated his agenda. It became apparent that stamping large retaining rings over 2.5

inches in diameter from coils of steel left a lot of scrap, which added unnecessary costs. Between June of 1993 and December of 1994 Bob purchased equipment that could coil steel wire into the shape of a retaining ring and stamp out the lugs, lug holes and minimum sections in a secondary operation. This worked best for retaining rings from roughly 2.5 inches up to 6 inches in diameter. This greatly reduced the scrap and allowed customers to purchase larger rings at more competitive prices than those offered by stamping.

Another expansion opportunity for the company lay in servicing the fastener and bearing distributors who supported the various OEM markets with smaller quantities of retaining rings. At the time Rotor Clip lacked the equipment to produce larger retaining rings from 7 inches in diameter and greater.

Unwilling to purchase larger sizes from foreign sources whose quality might be suspect, the company explored



other alternatives. Bob's son, Craig Slass, became Sales Manager in 1991 and convinced Bob to purchase a laser cutting machine. This technology enabled Rotor Clip to produce small quantities of larger retaining rings up to 10 inches (255mm) in diameter and over, if necessary. It also replaced the practice of having to make prototype parts from costly tooling before the parts could be verified as meeting production specifications.

With the laser machine firmly in place, Craig was now able to appeal to distribution to retain Rotor Clip as a "one stop shop" able to supply virtually any retaining ring they would need. Throughout the decade of the 90's major distributors one by one embraced Rotor Clip as their primary supplier of retaining rings. Today, Rotor Clip is still the dominant supplier of retaining rings to U.S. fastener and bearing distribution providing millions of parts per year to the nation's aftermarket supplied by these distributors.

The episode was not without its drama. Bob had been against the acquisition of the laser machine, noting it would

take several years for it to amortize its expense, if at all. Bob reportedly woke Craig in the middle of a night shortly after the machine was purchased. He expressed his reservations in the strong language he reserved for such matters. Despite losing a good night's sleep, Craig was able to prove over time that his decision was a good one. Not only did the machine prove its worth; today, Rotor Clip has 3 laser machines that still successfully provide large retaining rings and prototypes to customers all over the world.

In the meantime the drive for quality continued unabated. The ideas of quality gurus like W. Edwards Deming, Joseph M. Juran and Philip Crosby were taking hold as manufacturing underwent a transformation all over the world. Techniques like pareto diagrams, scatter diagrams and quality circles were integrating quality into every facet of the organization. Seizing on the best of these practices, Bob instilled in his company a culture of continuous improvement.

This meant that everyone from the machine operator to the floor inspector and beyond, was responsible for quality and meeting customer expectations.

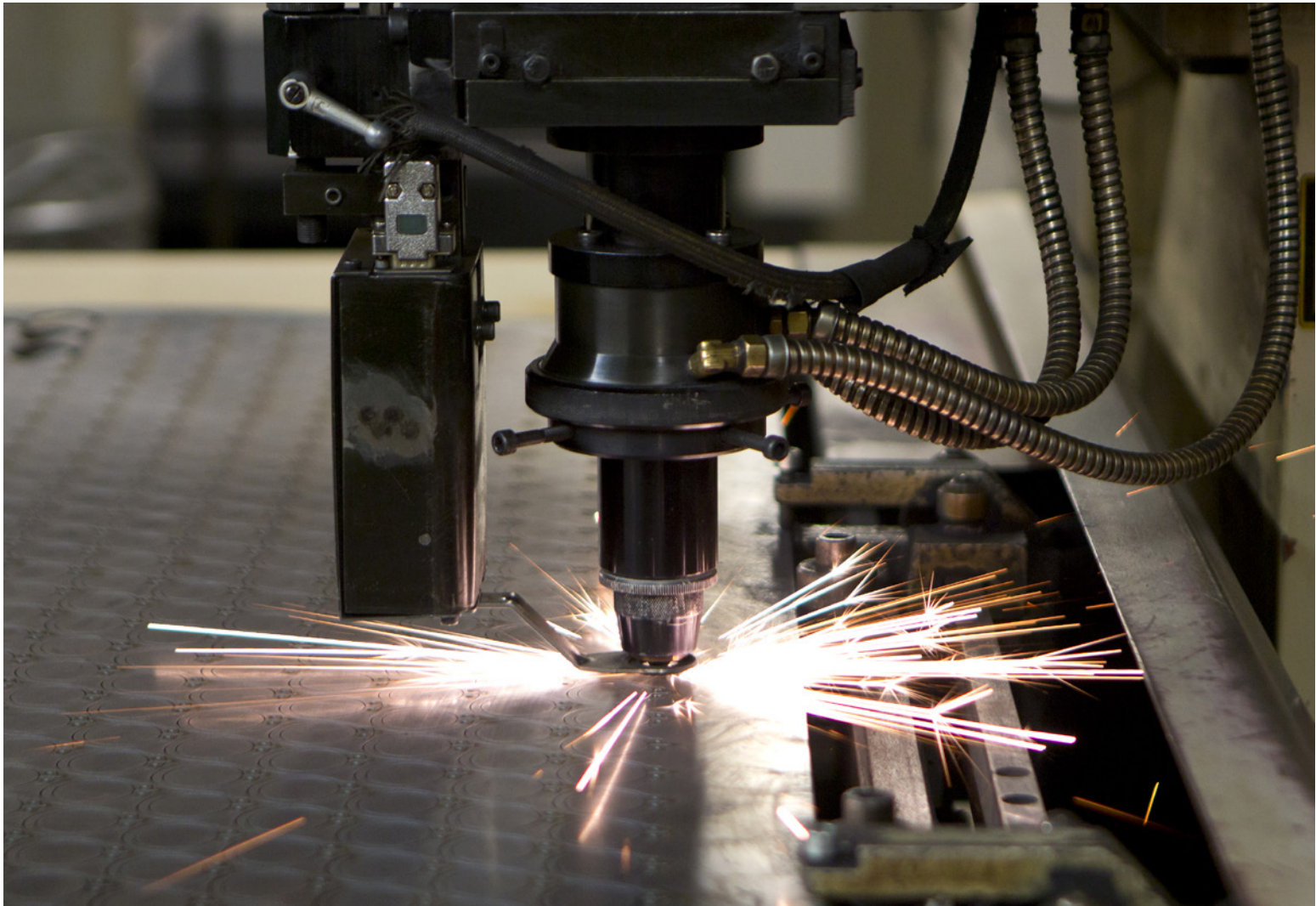


Rotor Clip won the prestigious "Trailblazer Award" in October 1998 given by the Power Transmission Distributor Association (PTDA) for its comprehensive online training guide for retaining rings.

WALLY BERLINER REMEMBERS BOB SLASS

The 1990's: Gearing up to Serve the Global Market





Rotor Clip purchased its first laser machine in 1991 to make large retaining rings and prototypes. Today, the company has three such machines in operation. (Photo by Frank Paul).

An example of this occurred in 1990. An automotive customer insisted on 100% inspection of a part they were purchasing, which was being used in a braking system. This type of inspection is inefficient, but Rotor Clip engineers designed an automated way to accomplish this without losing valuable production time. The improvement was written up in *Purchasing Magazine* in June 1990 noting, “Over 11,000 rings an hour can be tested, so the company doesn’t have to worry about missing delivery schedules...”

The drive for formalizing quality also continued in the 90’s with the establishment of yet another automotive quality requirement, QS (“Quality System”) 9000, which was awarded in conjunction with ISO (International Standards Organization) 9002. Rotor Clip successfully achieved both of these designations in November 1996. During preparation for this audit Rotor Clip reviewed and updated work procedures for every employee in every department of the company. The emphasis was on “Do what you say, say what

you do,” further driving home the critical role every employee played in assuring customer quality.

Rotor Clip also created its very first web site in April 1997. The site offered specification pages from the Rotor Clip catalog for downloading and showed examples of retaining ring applications. A printed training guide for retaining rings, entitled, “Rotor Clip University, the Ultimate Retaining Ring Guide,” was also added to the web site in 1998 as a training tool for distributors. This guide won Rotor Clip a “Trailblazer Award” in October 1998 given by the Power Transmission Distributor Association (PTDA) “...for excellence, innovation, performance and leadership in the power transmission/motion control industry.” *Transmissions Magazine*, Fall 1998. The training site was believed to be the first program of its type available to industrial distributors.

As Rotor Clip’s reputation grew, so did its market share in the U.S. It was now time for the company to look beyond the U.S. to the potential offered by overseas markets.

The 1990’s: Gearing up to Serve the Global Market



INCH VS METRIC

Retaining Rings

– Wally Berliner



Wally Berliner

The 1970's saw the emergence of strong rivals to our country's dominance of the world marketplace. This affected the retaining ring business as companies based in Europe were using a DIN metric system and those in Japan, a JIS system. These were very similar to each other, but very distinct from the inch standards we followed here in the U.S.

The main retaining ring players at the time were Waldes Kohinoor, Industrial Retaining Ring (IRR) and Rotor Clip. The three competitors held a series of meetings to decide how to counter the competitive threat of metric retaining rings versus inch retaining rings.

These meetings were held in New York City at the United Engineering Center on 47th and 1st by the UN. They always gave us a meeting room and sent one of their people to observe the meetings. Representatives from the "Big Three" retaining ring manufacturers were on hand to discuss strategies. I was with the Waldes team at the time representing their point of view. The meetings were very raucous and contentious because we had to decide: either support our inch system using soft conversions and fudge the numbers, (for example, a 19mm ring is very close to a 3/4 inch ring) or capitulate and adapt the DIN system.

By going the soft conversion route we would be able to save 75% of our tooling. So the companies decided to create a soft conversion line of retaining rings which were essen-

tially those inch rings that converted satisfactorily to metric dimensions. This became the ANSI Metric line, consisting of the MSH, MHO and ME series. Bob was more inclined to find a more suitable way to address the metric issue. Waldes however was very particular with the scientific detail and very eager to apply this to the ANSI metric line.

"We have to make the system seem text book and precise," they would say. Bob always came ready to fight and tended to do so. His response was, "I'll go JIS, I'll go DIN, I'll adapt, make it cheaper, more reliable. I'm not into the technical details; I just want to make a viable system."

The IRR representative was kind of the mediator between the two opposing philosophies of Waldes Kohinoor and Rotor Clip. We must have had at least 25 of these meetings in a span of about 2 years.

The outcome was basically inconclusive, but Bob and Rotor Clip were the ultimate winners. Bob decided to give people an alternative and let them choose. He began tooling the entire DIN line. It was quite a gamble at the time but it paid off in the long run. Bob's tooling of the DIN line enabled Rotor Clip to surpass its competitors and compete in the global market.

GO BACK



Manufacturing *Career* Focus

Operates a laser cutting machine
to produce retain rings of certain specifications

LASER OPERATOR

A Laser Operator is responsible for a laser machine, which cuts metal material into rings. Their purpose is to ensure that the responsibility for forming product is understood, and that forming operations are executed in accordance with procedures for safety, inspection, and operations. If the laser machine were to malfunction, the operator should be able to return it to working order.

At Rotor Clip, laser operators power up the machine, turn on the PC, send information to the laser to cut, load materials, operate and inspect, unload finished sheet, remove rings from sheet, and power down at the end of the work day. They must adhere to the job order given to them to make the proper adjustments for the rings to be cut.

Job Title: Laser Operator

Education: High school diploma

Qualifications:

- Required two week training with qualified Machine operator
- Ability to communicate well with supervisors and co-workers.
- One or more years of experience operating CO2 laser and/or cutting machines
- Ability to follow verbal and written instructions
- Possess knowledge of and ability to identify industry metals

Duties:

- Assuring that gages are within their acceptable calibration date
- Check raw material for defects
- Material selection
- Monitor operations of machine
- Labeling and handling of material
- Cleaning and adjustment of machine to ensure efficiency
- Programming of machinery



The 21st Century

Rotor Clip Goes Global

“(European) customers will; be supported by a steady flow of product from the US which will be shipped through our Sheffield center on a Just-In-Time schedule.”

Craig Slass, Fast Magazine, April 2000

It was a few minutes before midnight, December 31, 1999 and people around the world were holding their collective breath. Would computers recognize the last two digits of the coming year (00) as “2000” or “1900?” The New Year came with the usual fanfare, but, fortunately, the dreaded Y2K bug was nowhere to be found.

Rotor Clip also celebrated the New Year with the official opening of its warehouse and distribution center in Sheffield, England. Bob’s sons, Jonathan and Craig Slass had long sought to make Rotor Clip a global company. The conditions seemed right as the new millennium began. The costs of shipping goods to other countries had been steadily falling. Jet air shipping and refrigeration changed the status of goods that had previously been classified altogether as not tradable internationally. Now fresh-cut flowers, perishable broccoli and strawberries, live lobsters, and even ice cream

could be sent between continents.¹

The time was right and, after recruiting a veteran of the retaining ring industry in the UK, the Slass family officially opened Rotor Clip Ltd. in Sheffield, England, on January 28, 2000. The ceremony was attended by The Right Worshipful the Lord Mayor, Trevor Bagshaw, of Sheffield among other honored guests from the area.

“Sheffield has always had a long standing history of steel and related manufacturing industries,” Bob Slass noted at the time, “and we believe the depth of talent and skills needed to run our operation would be found here.”

Of course, the mixing of cultures did present some challenges in the beginning, particularly with language. It took some time to know where the “boot” of the car was (that’s the trunk) and that the “bonnet” was the hood. “Sausage on a bin lid” was a favorite luncheon sandwich and a “saloon”

¹ <http://www.nber.org/papers/w7858> GLOBALIZATION OF THE ECONOMY ,Jeffrey A. Frankel ,Working Paper 7858,

² <http://www.theguardian.com/world/2011/mar/14/germany-new-boom-making-stuff>





Rotor Clip opened a sales office in Idstein, Germany in 2001 opened an office in Idstein to better service current and future customers, to service this all-important market for retaining rings in Europe. Pictured above, one of the many trade shows attended by Rotor Clip sales personnel in Germany, AACHEMA, June 2015 in Frankfurt am Main.

was not a drinking establishment, but a 4-door sedan.

Shortly after, Rotor Clip retained sales representation in Germany to meet the demands of this important European economy. At the beginning of the millennium, German industry began to improve production techniques and IT to make their operations leaner and more profitable. German exports also surged as emerging economies like China sought to buy everything from German machine tools to cars. An effort in the early 2000's to export their cars all over the world is in evidence everywhere in China today particularly in cities like Shanghai and Beijing.²

Rotor Clip achieved a high degree of success in the German market and in 2001 opened an office in Idstein to better service current and future customers.

Meanwhile Rotor Clip continued to pursue quality be-

coming one of the first manufacturers in the world to achieve a TS16949 designation, the latest quality standard introduced by the automotive industry. TS required management to set goals and meaningful metrics to ensure the customer receives quality products delivered on time.

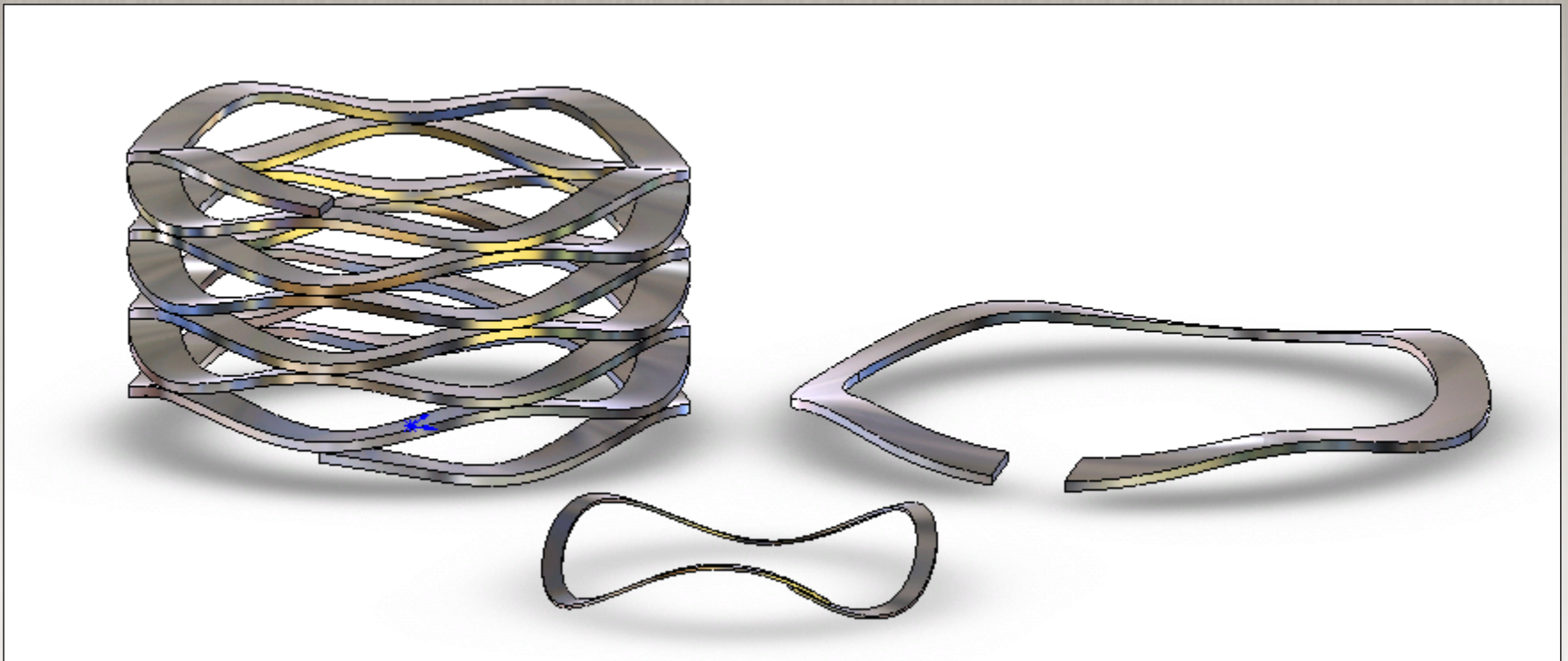
The decade also saw one of the most significant innovations in the retaining ring industry with Rotor Clip's introduction of automated "Rings on Wire" in 2004. "Rings on Wire" is an in-line method of producing retaining rings in which parts are formed then automatically fed on wires through the lugholes. The rings are then heat treated and finished while on the wire stack using special processes. This method prevents the rings from tangling making it much easier for customers to handle and apply retaining rings to their particular assemblies.

Rotor Clip also added two new offerings to its product

² <http://www.theguardian.com/world/2011/mar/14/germany-new-boom-making-stuff>

The 21st Century: Rotor Clip Goes Global





One of Rotor Clip's new product lines: wave springs.

line: spiral retaining rings in 2006 and wave springs in 2007.

Spiral rings are axially installed into machined grooves in housings/bores (internal) or on shafts (external) to retain assemblies. They provide 360° contact with the groove and offer more clearance than a tapered section ring. They are ideal for applications with lower thrust loadings.

A wave spring is coiled flat wire with waves added to give it a spring effect. Wave springs are superior to coil springs in certain applications because they provide lower

work heights with the same force. This not only provides for space savings, but also smaller assemblies that use less materials, hence lower production costs.

These new product lines brought Rotor Clip closer to becoming a one stop supplier for customers who purchased these items from several different vendors. They could now consolidate sources and further reduce transaction costs.

This was also the decade of acquisitions for Rotor Clip which began in 2009 with the asset purchase of Truarc LLC,



One of Rotor Clip's new product lines: spiral retaining rings.

The 21st Century: Rotor Clip Goes Global





Rotor Clip s.r.o. in Budyne, Czech Republic. Rotor Clip purchased this manufacturing facility just outside of Prague in December 2011.

the original Waldes Truarc business where Bob Slass began his career in the 1950's. The purchase was bitter sweet; Bob Slass passed away in January 2009, just six months before the purchase was finalized.



Rotor Clip purchased the assets of Waldes Truarc in 2009, the first place Bob Slass worked at in the 1950's as an engineer.

The next acquisition was Segnor in Budyne, Czech Republic, in December 2011 (which became Rotor Clip s.r.o.). The purchase gave Rotor Clip a second TS-certified manufacturing location to service the European and other

world markets. It also expanded the company's product line through its capability to produce very large retaining rings at extremely competitive pricing.

In 2012 Rotor Clip China opened its doors in Shanghai, China, as the company began exporting its retaining rings and wave springs to a market notorious for its low cost exports. The country's automobile industry is rapidly expanding to meet increased consumer demand. This requires reliable sources for quality parts and adherence to strict quality requirements which Rotor Clip can meet.

In 2015 Rotor Clip China expanded to a much larger facility which included a warehouse and additional space for a future manufacturing facility. Chinese customers will now have the advantage of localized product for expedited delivery and service.

As of this writing Rotor Clip has enjoyed record sales and a distinguished roster of customers that Bob Slass could have only dreamed of a half century ago.

The 21st Century: Rotor Clip Goes Global





Posing outside of the warehouse of Rotor Clip Ltd., UK, in 2000 are, from left to right, Joe Cappello and Craig Slass, Rotor Clip USA and Elaine Haigh, James Haigh and Geoff Haigh.



The official opening of Rotor Clip Ltd. in the UK on January 28, 2000. Lord Mayor Trevor Bagshaw and his wife Margaret (center) from Sheffield, UK, pose for a photo with other dignitaries and Rotor Clip personnel in the warehouse facility.

The 21st Century: Rotor Clip Goes Global





Rotor Clip China in Shanghai.



Rotor Clip has established a presence in China including attending relevant trade shows like the one pictured above.

VINCENT RODGERS REMEMBERS BOB SLASS

The 21st Century: Rotor Clip Goes Global



My 50 year journey from the Bronx to Jersey

– Vincent Rodgers



Vincent Rodgers

I started in 1966 with Rotor Clip in the Bronx; I was in my early 20's. What I remember most about Bob was that he was a happy guy. He had his limits like anyone, but most of the time he was in a good mood and very easy to get along with.

My first job with Rotor Clip was running a four slide machine, making a ring for the universal joints that were used in rear wheel drive cars in those days. I wanted to learn how

to die set the presses and Bob turned me over to a lead man, who taught me how to do this. Bob designed all the dies at the time and he had a tool room with about 3 or 4 people who actually built the dies.

The HO-175 retaining ring was a big seller for automotive. I remember one day Bob came running into the press screaming "We hit a million parts!" and then ran out. We just looked at each other and went back to work.



My 50 year journey from the Bronx to Jersey

Bob did just about everything in those days. He designed the dies, drove the fork lift, and went on the road to sell the product. When he wasn't on the road, he was in the shop. There were only about 3 or 4 people in the press room, which consisted of a total of about 9 presses.

Bob was adept at buying used presses and fixing them. I remember one time he bought a used 75 ton press and taught me how to scrape the bearings so that we could put it into service.

We were always trying new things and Bob would always go out of his way to satisfy a specific customer requirement. For example, internal rings could be like fish hooks, often tangling when placed loose in a box. A customer wanted a way to easily handle these, so Bob got plastic tubing and placed a number of rings on the tube with end caps, making a neat stack of the rings and solving the customer's problem.

He also modified the E ring dies. Instead of having a one row die, he designed it so there would be four or five rows significantly increasing production.

One time, we were making an SH-125, which usually resulted in a large piece of scrap in the center after the ring was stamped out. I put the die in, then Bob had me put in an SHR-62 die as well. He used this to stamp another ring out of the scrap before it was fed into the SH-125 die. This simple experiment was the start of the "rings within rings" concept that was Bob's signature work.

He used the same concept on an HO-244 ring. After the coil ran out, Bob had us re-band it and then run it backwards so it could use up all that scrap.

What I most remember about this time was that Bob was willing to let you learn, and let you make mistakes.

Bob was always looking for good people and he didn't care who they were or where they came from. I remember

one day he sent me to New York to pick up this guy from England. I met him at the docks from Manhattan. Bob gave him a job as a tool maker. Eventually he was able to move his family to the US and make Rotor Clip his long-term career.

He was also on the road, engineering trips to Detroit or Chicago, sleeping in his car, washing in the bathrooms. He wasn't the type of guy to throw money around and charge it to the business. No fancy cars or anything. He never really took time off, no holidays. He would come in through the back door and see what we were doing; he was always on the floor asking how is this or that or if we needed anything. We were always busy.

He continuously invested in the company, one of the reasons I believe he came to New Jersey. I helped him move, but he made me keep it a secret. He was afraid that many of the employees would leave and not follow him to New Jersey (there were only about 30 people in the entire company).

I was still in New York when the company first moved. Bob was paying my gas and my tolls. I used to leave New York at around 6am. Until one day he came to me and in his high pitched voice, screamed, "I can't do this anymore, Vinny. You are going to break the company!" With that he slammed the seven dollars down for my gas and tolls. I got the point and 6 months later I finally moved out here. Bob helped me get the house and another \$2,500 for moving expenses. That was about 1971.

But I'll always remember the good old days in New York. Whether it was driving Bob to Brooklyn or Manhattan or stopping at a deli or bakery for a bite (Bob knew all the best places for food), I always enjoyed working for Bob.

I guess that's why I have been with Rotor Clip for over 50 years.

GO BACK



The Future of Manufacturing

“ I hope America, our country, will stay industrially supreme and be able to absorb all the rings we can make. ”

Bob Slass quote, 1987

The claim that manufacturing in the U.S. was dying was a little short-sighted. According to the Bureau of Labor Statistics, manufacturing employment increased by 22,000 over the month of January and added 228,000 jobs last year in 2014.¹ Manufacturing follows the same trend of the economic business cycle with recession and expansion. It is the source of economic activity, and without the growth of manufacturing, the U.S. economy would be stagnant. Although the Great Recession hit during the latter part of the 2000's, there have been signs of recovery not just for the U.S. economy but also the manufacturing industry.

The U.S. economy was in shambles during the Great Recession, especially the manufacturing sector, which was already weakened by outsourcing and foreign competition.

After the recession hit, President Obama enacted a plan to revitalize American manufacturing and simultaneously established the Office of Manufacturing Policy in the White House.² According to an article published in 2011 from the New America Foundation, the U.S. was still the leader in manufacturing, creating 21% of goods globally; Japan and China placed 2nd and 3rd, creating 13 and 12 percent of goods, respectively.³ The real GDP of the U.S increased, “at an annual rate of 5.0% in the third quarter of 2014,” while the manufacturing sector was responsible for the production of 17% of all U.S. GDP.⁴ Additionally, the recent advances in automation, rising labor costs in China, and low cost of oil, will hopefully cause a resurgence of jobs in the U.S.

One thing is for sure, the future of manufacturing will be heavily impacted by emerging technology. New technology

¹ <http://www.bls.gov/news.release/empsit.nr0.htm>

² http://www.huffingtonpost.com/george-munoz-frank-islam-and-ed-crego/manufacturing-americas-future_b_2526102.html

³ http://growth.newamerica.net/publications/policy/what_the_president_should_have_said

⁴ <http://www.bea.gov/newsreleases/glance.htm>





has the ability to save cost and increase production; the recipes for growth and success for manufacturing companies. However, technology can also potentially reduce jobs, as automation takes over and renders certain jobs obsolete. Take for example the decline of car manufacturing jobs when numerous positions in the factory were automated. In addition to a loss in human jobs large factories and a large workforce were no longer needed.

According to an NPR segment on the future of manufacturing, “The one certainty we have is manufacturing is going to look more and more like computer programming and engineering. It’s going to involve a lot more brainwork and a lot less brawn work.”⁵ This means that with the growing use of new high-tech machinery, manufacturing companies will begin recruiting more highly skilled workers who are able to not only activate it, but maintain and identify problems within these high-tech machines, like the 3D printer.

It seems that U.S. manufacturing wasn’t dead; it just needed to reinvent itself once again. Apple has continued to grow and improve their Apple products, while their competition [Samsung and Google] have been quickly

catching up, by releasing their own operating systems and products. We recently saw Google expand its empire by moving their headquarters to New York and releasing information about their newest project for a self-driving car.

Or, just take a look at great manufacturing companies like Boeing and Raytheon, who continue to show growth. There has been an oil boom in North Dakota as it continues to show shale production expansion. And with the recent additive manufacturing, such as the 3D printer, the possibilities for manufacturing are endless. From the automobile to the ever-evolving 3D printer, it is imperative for manufacturing to evolve and grow as it has been a source for innovation and invention, generating revolutionary machines.

That growth will depend on future manufacturing entrepreneurs like Bob Slass whose devotion to engineering and daring vision will continue to shape raw materials into the products the world needs to improve the quality of life for all.

TED OWENS REMEMBERS BOB SLASS

⁵ <http://www.npr.org/2014/11/07/362226235/future-u-s-manufacturing-jobs-will-require-more-brain-than-brawn>

The Future of Manufacturing



A Lifetime of Loyalty for a Generous Gift

—Ted Owens



Ted Owens

At what point in an industry can a job mimic the idea of a functioning family? In Rotor Clip, Bob Slass wasn't exactly considered the jolliest boss to run the industry. He was often viewed as a stern guy who demanded everyone to be on task and understand the role of their job in the factory or office thoroughly. Of course as a genius engineer his social skills of talking to people generally came out more in a barking manner. However, underneath his strict demeanor there truly was a loving man who cared about everyone who worked for him.

I am a longtime employee and have been part of the Rotor Clip family since 1986. It's not every day where one can reflect on the tremendous emotional gift that a boss could give to a young newly married employee. Every time I tell this story the goose bumps always form on my arms, when I think about the generous acts of Bob Slass. When I first started working for Rotor Clip my wife and I recently got married and started looking for a house to live in. At this time it was very difficult for us to scrape up all the money together to purchase the home. While at work, I had previously mentioned to Bob that I was getting the money together to buy a house. Bob replied if I ever needed any help to see him. At first, I didn't originally want to ask my boss for a loan. However, after the disappointment of the bank denying my loan for \$5,000, I had nowhere else to turn. Although at first I was

reluctant about taking Bob's offer to help, I eventually came to my senses in order to provide for my family. The next day I nervously walked into Bob's office and asked him for the \$5,000 loan. Instantly, Bob said of course and got his check book out to write me a check. With such a generous gesture that a boss can give to me a young newly married employee, I was very grateful for his act of kindness and immediately started to pay him back weekly.

At around two months later I was still paying Bob back. At this point I had almost paid \$4,000 back and I was to receive a shocking surprise in which I had absolutely no idea. When the \$4,000 was paid back Bob had told his secretary to inform me that the last thousand dollars was a house warming gift for my wife and me. I was so appreciative that a man I was working for cared so thoroughly about me that he completely earned my loyalty for life. This is what marks an industry as a family. Bob Slass might have been a harsh man at times, but this was the love that he put into Rotor Clip as he looked after fellow employees as if they were his own family members. I like to think that the respect that I had for Bob, was the same respect that he had back at his employees for making his dream a reality.

[GO BACK](#)



Our Favourite Bob. *Moments*
Our Favourite Bob

Moments



THANK YOU

