Mules, Beetles and Flying Bulldozers

Theodore Patrick Flynn ……...and the products of his imagination

By Steve Hansen

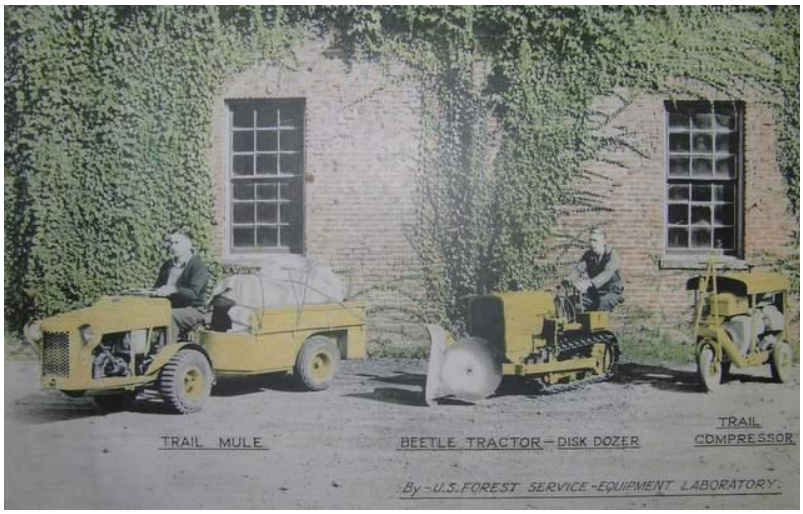


Figure 1 - Three pieces of trail maintenance equipment developed at the US Forest Service Equipment Development Laboratory during the 1940's - photo courtesy of the Oregon Historical Society

The Romance Begins

In 1993 while operating a small asphalt maintenance business in Hood River, Oregon I received a call from a man in Carson, Washington asking for a quote for some work on his driveway. After preparing and presenting the quotation for the needed work, the man and I proceeded to sit and visit for awhile. In the corner of his shop sat a very interesting pile of old iron that caught my eye.

The man's name was Buck Ober and he turned out to be a very interesting character. The Ober family had been involved in the logging and construction industry for years and after the logging business had more or less ground to a halt a few years earlier, he had gone to work for The Corps of Engineers at the Bonneville Dam. In his spare time Buck and a retired FAA inspector were hand building a Cessna 185 airplane virtually from scratch …….. like I said, he is a very interesting character.

The pile of iron that had gotten my attention turned out to be a "Beetle Tractor" that Buck had gotten in a horse-trade of some kind or another. "One of these days" he was going to put it all together. I had never heard of a "Beetle Tractor", but it was obviously very small and was a track-layer, it had a bulldozer blade, and the cutest little 4 cylinder flathead engine that I had ever seen. To make a long story short, as I left I told Buck that if he ever got tired of waiting to put the thing together he could call me and maybe we could work out some kind of a deal.

Buck never did call to do the work on his driveway that year, but the next spring I got a call from him asking if the price that I had given him was still good. After telling him that the price was probably still good, he asked me if I was still interested in the little tractor…….. He had my attention!

As it turned out, late in the previous year he had broken his leg and been laid-up for most of the winter. Unable to do much else he completely rebuilt the Beetle Tractor and it currently sported a fresh coat of paint and purred like a kitten. Buck's feeling was that just maybe we could work out some kind of a trade for the driveway work.

After finishing the work on Buck's driveway I loaded up my new machine and headed home. The only thing left to do was figure out how to break the news to my dear wife. About all that Buck knew about the Beetle was that someone said that they dropped these tractors out of airplanes in World War II for some reason. The air-drop notion seemed to surface again and again as I did my research, but the fact is that the technology for dropping equipment weighing 2,000 pounds out of airplanes did not exist until the era of the Korean War.

Figure 2 – Beetle Tractor # 141 as it first arrived home in Hood River, Oregon

The Hunt Begins

When I got home I immediately went to work searching the internet for any mention of the "Beetle Tractor", and I found absolutely nothing. Nothing that is, until several months later when I ran into another very interesting character named Carter Provo.

Carter lives in San Francisco and he loves tractors, he really loves old tractors, and he really-really loves old "little" tractors. "Yes", he knew all about the Beetle Tractor. He told me that if I would track down a copy of the September 1945 Popular Mechanics I could read an entire article on the Beetle and the amazing man that designed it. When I finally found a copy of the article I was amazed to find yet another very interesting character, a man by the name of Theodore Patrick Flynn.

The Fun Begins

Once the first few bits of information began to emerge, the process of gathering them all together and putting together a clear story has been a pure delight. The Popular Mechanics' article that Carter had mentioned was entitled "…Call Out the Mules and the Beetles" by Tom Riley and right there on page one was a picture of a Beetle Tractor with a blade full of dirt. The article talked of an entire army of miniature machines designed and built by the US Forest Service Equipment Development Laboratory in Portland, Oregon under the leadership of Theodore Patrick Flynn and his two chief assistants, Tom Caldwell and Arthur Kelly.

Later I was to learn of others that played a big part in all of this amazing creativity; other very interesting characters like Bud Waggener and Walt Lindauer. The article stated: "They think of a good possibility or someone in the Forest Service suggests a good idea through the regional office. It is roughed out in blueprint form. Then the workability of the machine and all possible improvements are discussed with forest rangers, lumbermen, and manufacturers, anyone who might have a suggestion. Not until then are pilot models built with the help of the capable mechanics in the Forest Service's maintenance shops, mechanics who often have some more good suggestions. The pilot models are then sent to the Forest Supervisors of National Forests, who give them a thorough and critical test through a fire season."[1]

Essentially, Ted Flynn had a crew, a budget, a fully stocked shop, and directions to build those things that might help get their mandated work done more effectively. One of the main challenges that the Forest Service had at the time was the regular maintenance of some 36,000 miles of foot and horse trails in the Pacific Northwest. Since there was no power equipment small enough to do the work without turning trails into roads, the majority of the work had to be done by hand or using horses - but I am getting ahead of myself. More on all of that later.

To get some kind of an idea of what kind of character Ted Flynn was, I would like to share the contents of a letter that Ted Flynn wrote to a long-time friend in the early 1950's. It makes for fascinating reading. It is really parts of two letters to the same man with some editing for clarity. The contents of the letters came in an article mentioned to me by another very helpful man by the name of Jerry Williams. Jerry was the Historian for the US Forest Service (he has since retired) and while he admitted that he didn't know too much about the Beetle Tractor or Ted Flynn he was aware of an article published in the Forest History Society's Quarterly Journal. Cheryl Oakes at the Forest History Society kindly forwarded a copy of the article and I became further enthralled by the character named Ted Flynn.

[1] Popular Mechanics Magazine, September 1949, page 130

The words of Ted Flynn to his long-time friend George Drake:

"I'd like to boast a little about early experience that qualifies me as a logger. Born on the banks of the Gatineau River, Province of Quebec, I won a log burling contest against a big French Canadian river driver when I was 13 years old. My uncle coached me for a month ahead, and guess how I did it? I shouted, "Baptiste your shoe lace he's untied." He look down and when he look back he was in de reevaire. I won a camera. I came to Oregon at 15 and Uncle Mike put me to work greasing skids for an ox team.

I remember a big flowing mustached guy named Jack Mulkey who wore only a red wool undershirt almost year around. He was the ox skinner. He could spit Peerless clear across the skid road and hit the lead lead-off ox in the eye. Mulkey and I both graduated to horse teams and when the little steam donkeys came along I graduated to whistle punk. Mulkey was so disgusted with me for leaving the skid road he said I never would amount to a damn from then on. I learned to find the ride of log ends so they wouldn't butt and turn the skids over. Saddling skids and sniping, and dogging logs was a real fine art them days. When I graduated to the log pond and the mill, Mulkey quit speaking to me completely.

At 19 they shipped me to school in Portland and all the real fun was over for me. But all that was a wonderful experience. It taught me how to move logs by taking the utmost advantage of every pound of leverage that could be applied. I think it was a background to develop an imagination for things and problems to come later in the fields of engineering. A skid road was located with tremendous amount of practical science. It could not be too steep or the logs would run over the bulls and couldn't have any adverse at all. You had to know where to use cross skids and why and where to use for'n afters - to get logs out from behind stumps. You had to know more about block and tackle leverages than Einstein knows about atoms.

In 1923 - 1924, with Ralph B. Moore (John Wood Iron Works), I designed, built and installed the first two-drum hoist on a crawler tractor, a 10-ton Artillery Holt Tractor, for logging a right of way on the Old Spirit Lake Road in the state of Washington. This was one of the first very important steps in extending the use of crawler tractors to the logging woods. A circuit court case, Willamette vs. Moore, later definitely established this invention as the first two-drum hoist on any tractor. Fred Brundage backed this experiment and his faith and vision in our idea is not only a credit to him, but also advanced this means of yarding logs by several years. Willamette Hyster got their clue from this development by (the) US Forest Service. Their engineers came to our camp and took notes and pictures, etc., and in 1926 they came out with their first commercial two-drum hoist. I was an observer at the first test of this hoist which was really the foundation of the Hyster business. Powers Wickes designed the commercial version of our hoist for the old Will-Hyster Co., he can verify this.

In September 1923, watching a little Cletrac pulling a small grader behind trying to open a new road up to Mt. Adams on a very steep hillside, where the grader

rolled over about 10 times one day, gave me the idea of why not an angle blade on the front of the tractor. The foreman Ralph Anderson and Ranger Mann said that's it. Without funds Blacksmith Joe Meadows and myself built a counterbalanced, hand-lift, angle blade bulldozer using a worn horse grader blade and scrap metal. We attached it to this little Cletrac tractor and put it to work early in 1925 on our Carson-Guler forest road. It was very good for side casting and moved as much material as three teams of horses and fresnoes. It fell off in a few days but it proved the idea. We fixed it better and in 1926 this early haywire bulldozer ran the horses off the job. But the idea was hatched and design made in 1924 for this first bulldozer I ever saw or heard of, and I searched the machinery market pretty well before building it.

After getting a Killifer Engineer to look at ours they built a walking beam (no power lift) model and sent it to us for trial in early 1926. Also in 1925 I connected cable power to our old 1924-25 bulldozer, then transferred it to a 2 -ton Holt Tractor and provided power lift. This was the first cable power lift. Late in 1927 I got word that Mack Woolridge was building a few power lift bulldozers for 20 Cletracs.

In 1928 all forest engineers were invited to a big road meeting near Santa Barbara, California. The equipment committee did not want to show a bulldozer at this meeting. They had a tractor-drawn road grader, a tiny gas shovel, and some horses with fresnoes for the show. I got to Santa Barbara ahead of the meeting and tipped off Woolridge, Killifer, and Earl Hall to be at the show. Some way or another I jammed their dozers right into the field demonstrations, and after bribing two Mexican operators with five bucks each they kept one little bulldozer going at all times. The bulldozers stole the show. I am quite sure this show was the real or first big awakening to the possibilities of bulldozers, because there was a large attendance including Caterpillar Tractor engineers (as well as) highway and forestry engineers from Washington D.C.

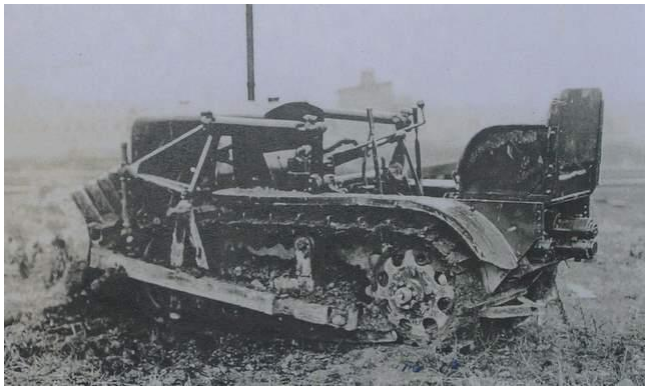
From 1928 on things started buzzing among manufacturers like Masters of Los Angeles, La Plante Choate, and others. Some noteworthy or outstanding improvements to the bulldozer in its evolution from the first little hand lift models up to now were inspired and brought about by leaders in the logging industry like Ed Stamm and George Drake who had the vision and were willing to bet on these pioneer developments in the days when the majority of operators were skeptical or hanging back.

Crawler tractors were originally designed strictly for agricultural use - draw bar pull only - and as the use of bulldozers increased it was very evident that tractors had to be improved a lot to withstand the new severe strains imposed by the bulldozer (blade).

I actually saw a tractor factory engineer walk away from
myself and some forest engineers who we had pleaded with him for two days to strengthen up their final drives, steering drum setup, and final gear cases. He wasn't sure that the bulldozer was here to stay and such improvement to the tractor would cost a lot of money. That poor fellow is dead now; I'll bet his conscience killed him. I'm confident that the Northwest woods operations in the

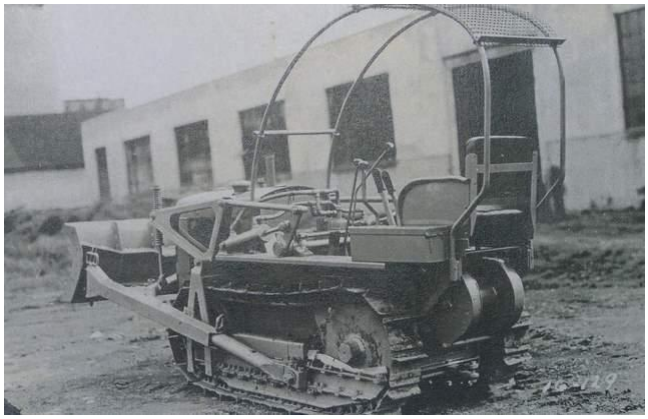
earlier days, and of course road contractors later, made the crawler tractor what it is today and we did contribute a lot more than just the bulldozer.

The Forest Service at Portland built the first power lift pull grader that I know of in 1930. Engineers from all the grader companies came here to see our power lift in use and a year or so after that power lifts on pull graders started to appear commercially. We developed a hundred more valuable ideas of improvement which were adopted and used by equipment manufacturers.



In 1936 I was put in charge of the Forest Service Equipment Development Laboratory in Portland. Our next outstanding contribution came in 1937 when I designed a new midget trail tractor which had several advanced design features.

In 1942 this little tractor was adopted by the U. S. Army for its Airborne Engineers. I went east and got its construction started. A general in the Airborne Division sent me a citation stating that the quick availability of the Airborne Tractor Design (our 4000 pound trail tractor) advanced their North African schedule three months.



There is only a small percentage of the world today that has any idea of how much the rough and ready mechanics, the welders, the woods bosses, the logging superintendents of the (Pacific) Northwest woods contributed toward developing the most universally used and by far the most valuable all round material moving machine in the world "The Tractor Bulldozer"." [2]

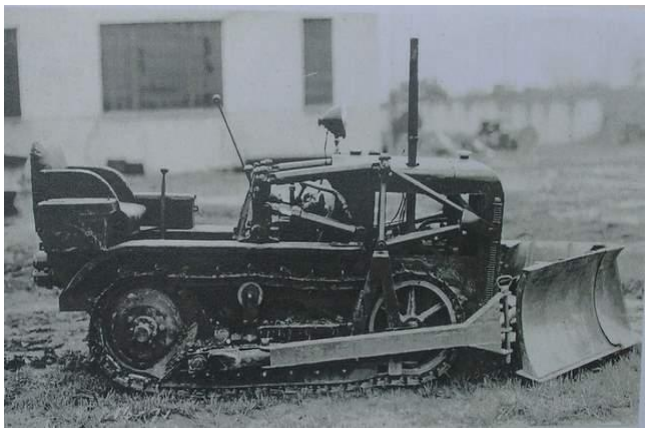


Figure 3 - Several photos of early prototype tractors built in the Equipment Development Laboratory Shop – Photos courtesy of the Oregon Historical Society

[2] Personal letter fromTed Flynn to George Drake – circa 1950 –From Bulls to Bulldozers by Josehph A. Miller, Forest History Volume 7, No. 3, Fall, 1963, with permission

Ted Flynn was indeed a colorful character and while he may have "blown a little smoke in his day" he was a true innovator, a thinker, and a man that played a key role in the development of a signature piece of motorized construction equipment. Sad to say, history has pretty much ignored most everything that Ted Flynn and his marvelous associates accomplished.

Today, construction is on-going for the US Forest Service Museum in Missoula, Montana and hopefully they will at some point choose to acknowledge his accomplishments and contributions to both the US Forest Service and to the construction industry.

Once most of the wrinkles had been worked out of the prototype crawlers the mechanics, engineers, and fabricators at the Equipment Development Laboratory went to work on a number of "refined" models for field testing throughout the region. These "shakedown cruises" proved quite useful in the determining of further weaknesses and strengths of the basic design.

The development and testing process in the forests of the Pacific Northwest continued apace until the outbreak of World War II when the focus of the whole world, including the US Forest Service, changed dramatically.

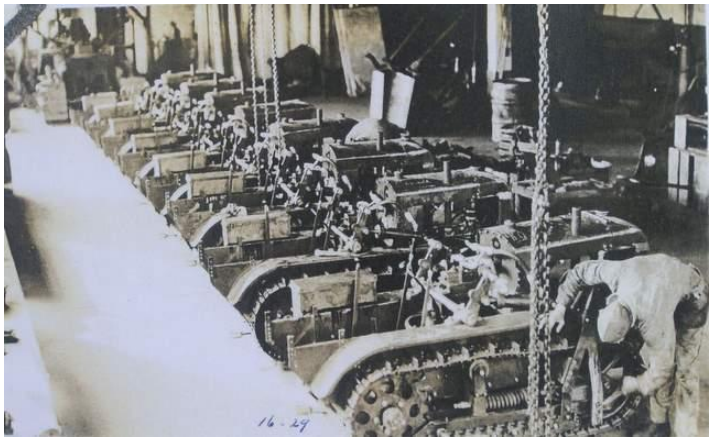


Figure 4 - The wizards in the Equipment Lab went to work building some improved working models for further field testing - Photo courtesy of the Oregon Historical Society

World War II Causes a Change in Direction

After coming to understand the story of the Forest Service Trail Tractor I turned my attention to the crawler that Ted Flynn had developed for the Army Air Corps. That tractor was known officially as the "**Tractor, Crawler Type, Gasoline, 20 D.B.H.P., With Bulldozer and towing winch. Model CA-1 "Clarkair**"[3]. The only information on the Clarkair that I had managed to find prior to that was the **erroneous** information found at the US Air Force Museum at Wright Patterson Field in Ohio. The **real** story of the Clarkair Crawler of WWII is a fascinating one and is tied inexorably to the history of the Beetle Tractor.

[3] War Department Maintenance Manual and parts catalog TM5-3020

The story goes like this:

On May 14, 1942 Brigadier General Stuart C. Godfrey, Air Engineer, Directorate of Base Services, Army Air Forces sent a letter to the Chief of Engineers, US Army Corps of Engineers, outlining his idea for a completely new type of Engineer Unit. [4]

General Godfrey's proposed unit would be a highly mobile Engineer Battalion with equipment small enough to be transported by the Douglas C-47 "Skytrain" or the Waco CG-4A "Hardian" glider. Being air-mobile, these units could be flown very near the front or even behind enemy lines to rehabilitate recently captured airfields or construct the most basic types of forward airfields.

Previously, all military engineering operations had required that construction equipment be "ground transported" into areas already secured, along railways and roadways already filled to capacity with tactical equipment and troops. General Godfrey's proposed units represented a truly innovative approach. The General's idea was based on his realization that the effective range of bombers and fighters was not totally dictated by their flying speed and fuel capacity; but by their proximity to the action as well.

During a conference held in Washington DC on June 8, 1942, General Godfrey, LTC Ellsworth Davis of the Engineer Board, and LTC H. G. Woodbury of the Aviation Engineers brainstormed on this new concept. Work was begun on a Table of Organization[5] for the Airborne Engineers and the process of procuring the equipment that they would need was begun. From the outset it was clear that the organization and training of the needed personnel would be the easy part of the process; the key would be finding the specialized equipment that the units would need.

The Engineer Board lost no time attacking the equipment problem - there was a war on and time was of the essence. Acquiring the support equipment (air compressors, rollers, scrapers, graders, asphalt heaters, etc.) proved to be no real problem. The tractors on the other hand, were quite another matter.

In reviewing the development project, the Engineer Board stated, "The machine that came closest to meeting the requirements was a crawler-type trail tractor that had been developed by the United States Forest Service in Portland, Oregon. Its size was approximately that of a Jeep, it weighed only 3,600 pounds, and it was equipped with a special master clutch control that eliminated reverse gears and gave the tractor and equal range of power and speed for moving either forward or backward."[6]

It was the "Trail Tractor", designed by T. P. Flynn, that had already caught the eye of the Army Air Force as it began to gear up for World War II. Another AAF division was in need of a towing tractor for large bombers and had already

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[4] Letter from AAF to Office of Chief Engineer, 14 May 1942, no file, sub: Airborne Aviation Engineers

[5] Table of Organization No. 5-455, May 4, 1942

[6] History of the Development of Mechanical Equipment, Historical Staff, The Engineer Board, Section IX Tractors, Dozers, and their Armor, Chapter 6, Airborne Tractors, 11 November, 1946

selected the "Trail Tractor" as the most suitable platform to modify for that task. Clark Equipment Company of Buchanan, Michigan had been issued a contract[7] to construct two test models for the Army Air Force.

In order to expedite the production of the tractor needed to outfit the Airborne Engineers, the Engineer Board made arrangements to have Ted Flynn temporarily loaned to Clark Equipment Company, where along with 15 of Clark's best engineers, the design for the Clarkair CA-1 was developed.[8]

The Clark Equipment Company of 1942 was one of the preeminent equipment manufacturers in the country, with an outstanding reputation for quality. With the onset of World War II they, like so many other industrial firms, were asked by the military to produce many items for the war effort that were only remotely connected to their peacetime production. For Clark Equipment Company the Clarkair was one such item.

While Clark had never before built a crawler tractor, they certainly knew their way around gears, transmissions, axles, castings, and production schedules. From just two machines[9], to sixteen[10], to one hundred sixty-two[11], to an order for one thousand[12], Clark Equipment Company showed that they "could get the job done."

Figure 5 - Clarkair CA-1 Crawler - Photo courtesy of the Army Corps of Engineers

By the summer of 1943, for a number of reasons (including manpower shortages), Clark Equipment Company convinced the Engineer Board that American Machine and Metals of East Moline, Illinois, should take over the production of the Clarkair. The transition process proceeded in stages and by January 1944 American Machine and Metals had totally taken over the Clarkair project.

On August 18, 1942 the First Provisional Airborne Engineer Aviation Battalion was activated at Westover Field, Massachusetts (the 871st Airborne Engineer (Aviation) Battalion). By October 8, 1942 two hastily trained companies were on their way to North Africa where they landed near Port Lyautey, Morocco on

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7 EB Contract W-145-eng-457, 22 August 1942, with Clark Tructractor Division, Clark Equipment Company, for $ 10,000

8 Memo from Special Studies Section to Executive Officer, Engineer Board, 17 August 1942

9 Army Air Forces, Corps of Engineers Report ME-9, 11 November 1946

10 Report of the President to the Board of Directors, Clark Equipment Company for the year 1942, dated 30 April 1942

11 Engineer Board Contract W-145-eng-511, 10 November 1942, with Clark Tructractor Division, for 162 units: unit price $2,650

12 Army Air Forces, Corps of Engineers Report ME-9, 11 November 1946

November 8, 1942. Meeting stiff resistance, the Airborne Engineers had to fight first and after losing one man and suffering numerous other casualties they worked 16 straight hours repairing a damaged airfield just outside of Port Lyautey. Three days later General Doolittle wanted two airfields built one thousand miles away in the Tunisian desert and members of the newly redesignated 887th Airborne Engineer (Aviation) Company boarded 25 C-47's and were on their way to Biskra, Algeria[13] A copy of an AAF training video showing the Airborne Aviation Engineer equipment in action is available in a two part presentation on youtube.[14]

The timing for all of this was truly astounding, with the concept being proposed in mid-May and the men and equipment being on their way into action by early October. Had it not been for all of the early development work done by Ted Flynn and his team at the US Forest Service, it never could have happened so quickly.

The 871st Airborne Engineers had their two missing companies replaced and sailed for New Zealand, then on to Australia where they staged for their part in stopping the Japanese assault on Australia. The itinerary of the 871st went on to include such exotic-sounding places as Tsili Tsili, Nadzap, Gusap, Owi, Biak, and Floridablanca[15]; but it would be no south-seas vacation. One of the three most notable instances of airborne aviation engineer employment involved the 871st in New Guinea in July 1943.

Figure 6 - Elements of the 871st Airborne Engineer Battalion (Aviation) prepare to go to work on the Kaiapit airfield in New Guinea on 24 September 1943

The Allies needed a base for fighters near the Lae-Salamau area, which they proposed to seize in September; this base might also serve for refueling bombers that were neutralizing the formidable Japanese air and naval establishment at Wewak.[16] The success of this operation would enable Allied forces to begin pushing the Japanese forces off of New Guinea and begin the long march towards Tokyo.

The 877th Airborne Engineers landed on Normandy Beach on July 8, 1944 and they "Built and Fought" their way across France and Belgium. At the close of the war the Battalion is spread across Europe maintaining airfields in France, Belgium, and Germany. Those that survived the long war finally boarded the S.S. Parker at Southampton, England for the long trip home.[17]

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13 Personal recollections of Samuel Parmalee, Commanding Officer, 871th Airborne Engineer (Aviation) Battalion

14 http://www.youtube.com/watch?v=V8D_5_qsEik

15 Station Record, 871st Airborne Engineer (Aviation) Battalion

16 The Army Air Forces in World War II, Vol. VI, pp 280

17 Personal recollections of Paul Murphy, 887th Airborne Engineer (Aviation) Company

Figure 7 – The Flying Bulldozer, World War II pocket Insignia for the Aviation Engineers

One of the more amazing accomplishments of the Airborne Engineers took place in the China-India-Burma theater of the war. In what were the first real "Air Commando" operations in history, Airborne Engineers of the 900th Airborne Engineer (Aviation) Battalion played very key roles. Operation Thursday as well as others utilized gliders to fly the Engineers behind the Japanese lines to build primitive landing strips that could be used to both ferry in reinforcements and ferry out the injured. I have some wonderful video footage of the events in Burma and New Guinea, an Air Force training film dealing with the Airborne Engineers, and a special Air Force clip dealing with Philip Cochran and the events of Operation Thursday in Burma. There is a video clip that shows the main aspects of this operation which can be viewed on youtube.[18]

Figure 8 - Clarkair CA-1 goes to work in the jungles of Burma during "Operation Thursday" – early March 1944

[18] http://www.youtube.com/watch?v=KGcmLmDHyUw

Figure 9 - Shoulder patch for the China – India - Burma Theater during World War II

Beginning with participation in the first direct American deployment in World War II, during the invasion of North Africa in Operation "Torch", the 871st Airborne Engineer Battalion (Aviation) until the final landing on Japanese soil at Atsugi Airfield on August 26th, 1945 by members of the 872nd Airborne Engineer Battalion (Aviation), the Airborne Engineers answered the call and did their part.

Figure 10 - Elements of the 872nd Airborne Engineer Battalion (Aviation)
Refurbish portions of Atsugi Airfield at the end of WWII

As true "Builders and Fighters" the Airborne Engineers were involved in every theater of operations of World War II; and one of the key pieces of equipment in their toolbox, was the little track-laying bulldozer designed by Ted Flynn.

Many Helping Hands

During the process of my research efforts concerning the Clark Airborne Tractor, as it is often called, I met many other interesting characters, not the least of which was a man by the name of Ray Rigaud. Ray is a machinist by trade and has owned a number of the CA-1's over the years as well as some attachments that went with them. The miniature CA-1

Figure 11 - Ray Rigaud's American Machine and Metals
Clarkair CA-1 # 1441569 - Hyde Park, New York

that he created is a wonder to behold and Ray's website[19] has many very interesting pictures of the amazing things that he has done to restore his equipment. Over the years Ray has compiled a list of CA-1 owners that stretch from Belgium to Australia and on to New York and Washington State. While the Air Force Museum at Wright-Patterson Field in Ohio stubbornly refuses to acknowledge more than 16 machines ever being built, Ray's list shows way more than that surviving today – go figure.

Figure 12 - Case SI wheel tractor – Army Corps of Engineers Photo

Through Ray I also met another most interesting character by the name of Darrell Smoker. Darrell is the proud owner of the Clarkair's wheeled cousin the Case SI Airborne tractor. Darrell retired from the US Parks Department and is a Researcher and Historian of the first caliber.

Darrell also really knows his way around the National Archives and kindly provided much documentation regarding the development of the equipment for the Airborne Engineers. Darrel's restored Case SI wheel tractor and Converto trailer are excellent pieces of restored history

Figure 13 - Darrell Smoker's perfectly restored Case SI wheel tractor and Converto trailer

Many others helped with the research into the history of the Airborne Engineers: , Herb Mason of the First Air Commandos, Dr Ron Hartzer of the Corps of Engineers, Major Mark Zaitsoff USAR (Ret), Dr James Dunn Department of the Army History Office, Claire Furgeson's wonderful stories, Samuel Parmalee the Commanding Officer of the 871st Airborne Engineers and Paul Murphy of the 877th Airborne Engineers, and many many more – to all of them I am deeply indebted.

[19] (http://www.syltech.net/ourwork.htm).

The Post-war Years

Now we arrive back to the time when Ted Flynn's fertile mind set about pulling together all of the lessons learned from 1925 through to the end of World War II. The result would be small, but it would also be one of the most over-engineered pieces of construction equipment ever built: The Trail Beetle Tractor.

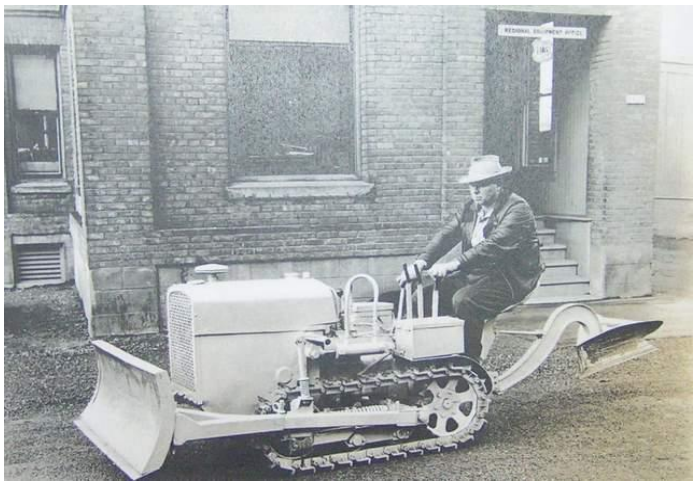


Figure 14 – Ted Flynn aboard a new Beetle Tractor delivered from Western Gear Works, Seattle , Washington in 1945 – photo courtesy of the Oregon Historical Society

The specifications on the Beetle Tractor are as follows:

The engine was the Waukesha ICK series in-line four cylinder flathead gas powered behemoth. Boasting all of 61 cubic inches and a staggering 12-14 hp, the little jewel produced 1600 pounds of drawbar pull. There were two models – the Narrow gauge for trail use (27 ½ inches wide) and the Wide gauge for fire fighting use(32 ¾ inches wide). Weighing in at 1,800-1,850 pounds these babies were not the little kit tractors that you could buy out of the back of a Popular Mechanics magazine. The transmission and differentials in the Beetle are Oliver OC-3 units that hold up well in those 4,000 pound crawlers and virtually indestructible in the Beetle. The unique reversing gear-box with twin-disc wet clutch system was an innovation of the first degree and has gone on to withstand the test of time.

"The Trail Beetle does not have a frame in the ordinary sense of the word. Its "backbone" is formed by rigidly bolting the engine, clutch housing, transmission, and steering differential into one unit. A leaf spring mounted on the under side of the clutch housing transfers the weight of the engine to the frame of the track assembly on each side. The final drive housings also mount the dead axle on which is mounted the track frame and the pivot point of the bulldozer blade. A wishbone ties the engine and the front tow hook to the dead axle. The seat post is bolted to the top of the transmission. The draw bar fastens directly to the dead axle."[20]

[20]Description from the Laurentide Beetle Tractor Manual

Figure 16 – One of my all-time favorite pictures of a Beetle Tractor in the back of an old Dodge pickup in the parking lot of the Forest Service Equipment Lab – picture courtesy of the Oregon Historical Society

The Beetle Tractor project was finally let out to bid and Western Gear Works of Seattle, Washington were awarded the contract. While some of the specific details are still somewhat sketchy, the gist of it all is that somewhere around 90 machines were produced. Fifteen were produced for the US Forest Service and the remainder were sold on the open market by Western Gear.

Unfortunately, the market for such a machine was very weak and the needs of the US Forest Service shifted from trails to roads as the post-war home building boom erupted. The "need" for the Beetle had passed and no further commercial models were ever constructed. Of the 90 or so units produced (along with a number of prototypes), few remain. I know of about 30 that remain and anyone that has actually seen one stands amazed – they are truly amazing little tractors.

The oldest remaining Beetle Tractor (# 110) is currently in the possession of the State of Oregon Surplus Property Division in Salem Oregon. I am currently lobbying hard to get it into the Antique Powerland Museum in Woodburn, Oregon for public display.

UPDATE: August 2009 – Trail Beetle # 110 was presented to the Antique Caterpillar Machinery Museum located at Brooks, Oregon today by Marv Fery of the Oregon Department of Transportation and will soon be on permanent display.

FigurFigure 17 – Original Western Gear Works advertisement for the Beetle Tractor – circa 1945 – Photo courtesy of the Oregon Historical Society

Another interesting character found along the way was Robert Wolfskill. Robert is a retired US Forest Service employee that owns Beetle # 117 and has provided some very useful first hand information concerning the disposition of the original 15 machines that were built by Western Gear works specifically for the Forest Service.

The original Popular Mechanics' article stated that the Beetles could be found from Canada to French Equatorial Africa (I have never verified the Africa part), but I have found Beetles from Canada to California and from New York to Georgia.

The Canadian Connection

Under some sort of arrangement that I have yet to learn much about, Ted Flynn and the Canadian firm known as the Laurentide Equipment Company Limited, manufactured a Canadian version of the tractor known as the Laurentide Beetle during the same period.

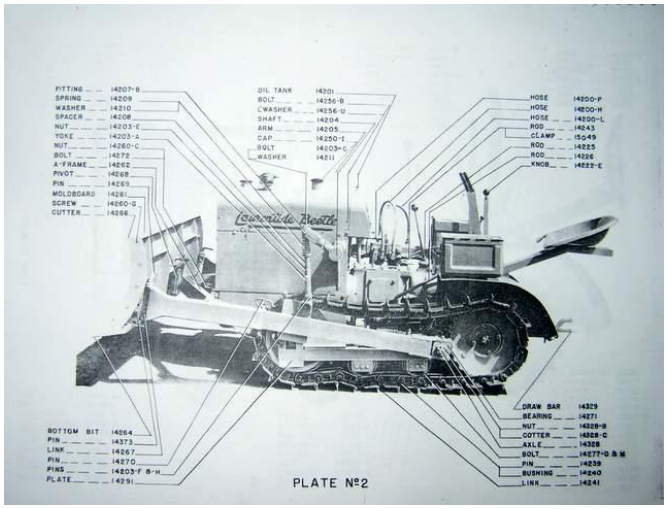
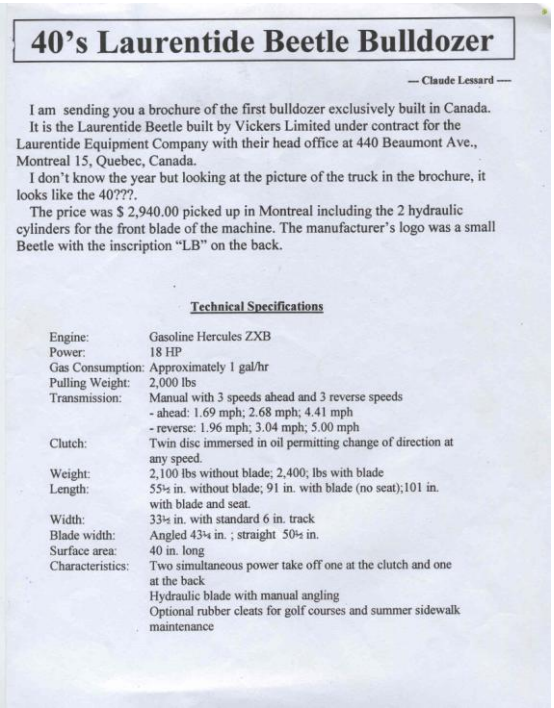


Figure 15 - Plate No 2 - Laurentide Beetle Manual

The Laurentide Beetle was powered by a Hercules ZXB Series engine instead of the Waukesha ICK but seems otherwise to have been identical. I have thus far been able to find much information at all concerning the Laurentide Beetle but I have found 5 or 6 machines that still exist.

Henry Nickelsen of Kakabeka Falls, Canada provided a copy of the original manual for the Laurentide Beetle that I have available if anyone needs a copy and I also have an original Hercules ZXB manual if anyone needs a copy of it.

Figure 18 - Laurentide Beetle somewhere in Canada - Photo courtesy of the Oregon Historical Society



40's Laurentide Beetle Bulldozer

— Claude Lessard —

I am sending you a brochure of the first bulldozer exclusively built in Canada.

It is the Laurentide Beetle built by Vickers Limited under contract for the Laurentide Equipment Company with their head office at 440 Beaumont Ave., Montreal 15, Quebec, Canada.

I don't know the year but looking at the picture of the truck in the brochure, it looks like the 40???.

The price was $ 2,940.00 picked up in Montreal including the 2 hydraulic cylinders for the front blade of the machine. The manufacturer's logo was a small Beetle with the inscription "LB" on the back.

Technical Specifications

Engine:	Gasoline Hercules ZXB
Power:	18 HP
Gas Consumption:	Approximately 1 gal/hr
Pulling Weight:	2,000 lbs
Transmission:	Manual with 3 speeds ahead and 3 reverse speeds - ahead: 1.69 mph; 2.68 mph; 4.41 mph - reverse: 1.96 mph; 3.04 mph; 5.00 mph
Clutch:	Twin disc immersed in oil permitting change of direction at any speed.
Weight:	2,100 lbs without blade; 2,400; lbs with blade
Length:	55½ in. without blade; 91 in. with blade (no seat);101 in. with blade and seat.
Width:	33½ in. with standard 6 in. track
Blade width:	Angled 43¾ in. ; straight 50½ in.
Surface area:	40 in. long
Characteristics:	Two simultaneous power take off one at the clutch and one at the back Hydraulic blade with manual angling Optional rubber cleats for golf courses and summer sidewalk maintenance

Figure 19 - Specification sheet - Laurentide Beetle

A Few Pictures

Figure 20 - Gerald Walke's Wester Gear Works Beetle Tractor # 198

Figure 21 - Paul and Sharon Sisson's Laurentide Beetle - circa 1949

Figure 22 - Robert Wolfskill's Trail Beetle # 117 and "friend" on a road trip

Finally, near the end of the entire cycle, Flynn and the engineers in Portland built two prototype 4,000 pound "Senior Beetle" tractors thinking to replace the last of the surplus Clarkair crawlers as they faded out of existence. One of those tractors is known to still exist and is in the very capable hands of another interesting character, Don Cooke. Don is a retired millwright and farmer that expects his Senior Beetle to "earn its keep".

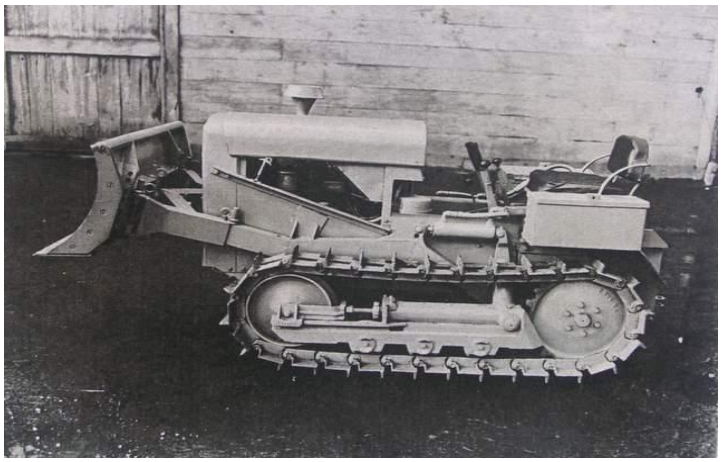


Figure 23 – Vintage picture of one of the two "Senior Beetles" designed and built to replace the Clarkair CA-1 crawlers – a need that never materialized

Figure 24 - Senior Beetle X2 heads for the barn with Don Cooke at the helm

All in all, the story of Ted Flynn and his band of merry engineers is a fascinating one. One of the most amazing chapters came when was able to meet and visit with one of those men in person. That amazing character was Lawrence A. Waggener Jr. Mr Waggener, known as Bud to his friends, had worked with Ted Flynn and had maintained a set of records and documents from that time period that was “jaw-dropping” in its scope. Bud had pictures and personal stories from an era that was filled with excitement and promise, and he shared all of that with me.

During my search for information about Ted Flynn I came across a box full of treasures at the Oregon Historical Society that provided some wonderful pictures and precious other materials. The staff of the Research Library was most helpful in allowing access to their historic materials and special thanks go to Scott Daniels and MaryAnn Campbell.

Ted Flynn died in 1954 and I have tried very hard to find any of his descendants, thus far without success. It would be nice to share with them some of the stories about their great grandfather and his amazing accomplishments

The Region 6 Trail Motor Grader – Prototype # 2

At one point in the late 1940's Bud was tasked with engineering and building a miniature power grader for work on the trail maintenance program. After designing and building a single prototype and conducting a series of field trials Bud went to work on a new set of drawings. The result was a extraordinary piece of engineering. By turning the Beetle engine and transmission assembly around and facing it to the rear and building the grader portion from scratch according to Bud's drawings, the fabricators at the Equipment Development Lab were able to come up with a really slick miniature power grader.

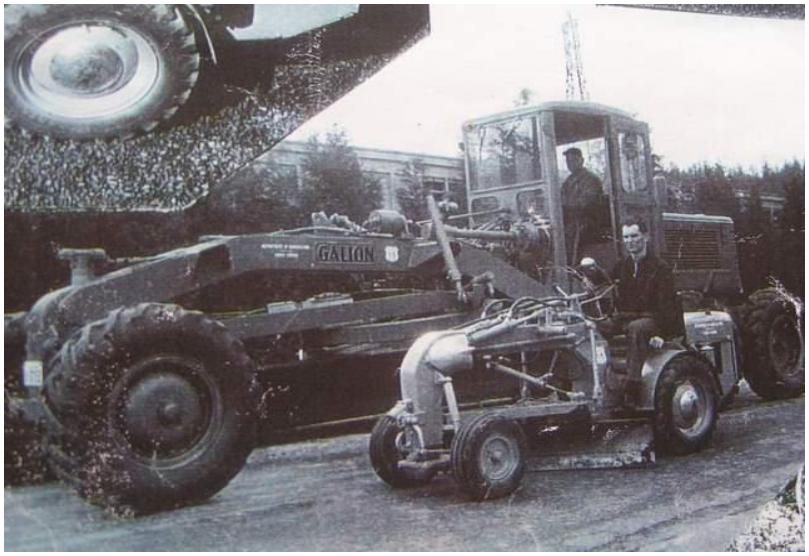


Figure 25 - Young Bud Waggener aboard his newly designed and constructed R6 Trail Motor Grader in 1945 Photo courtesy of Bud Waggener

When asked what had ever happened to the grader, Bud stated that the machine had been "surplused-out" to the University of Portland back in the 1950's. I was reasonably sure that this one-of-a-kind treasure had been lost forever. That is until one day in 2001 when, on a whim, I called the University of Portland Maintenance Department and asked if anyone around there knew what ever happened to the little grader that they had back in the 50's. The guy that answered the phone said "sure, the guy that bought it just lives down the street." You could have knocked me over with a feather. I immediately drove to North Portland and met the man that owned it and tried to buy it. He wanted to hold on to it, but I was amazed to have been able to see it and get some current pictures. True to form the next spring the owner called and offered to sell the grader to me.

Figure 26 – Bud Waggener Jr. at work

After getting the Trail Grader home I set about tracking down a replacement water pump/governor assembly for it and repairing all of the little things that needed attention. Once I got it running well I immediately put it to work in the home landscaping project that I already had going. The machine worked like a dream and once I was convinced that things were working smoothly I called Bud Waggener and invited him up to take the old gal for a spin. It was a warm summer day when Bud and his family arrived and watching Bud run the grader back and forth that day is one of my fondest memories.

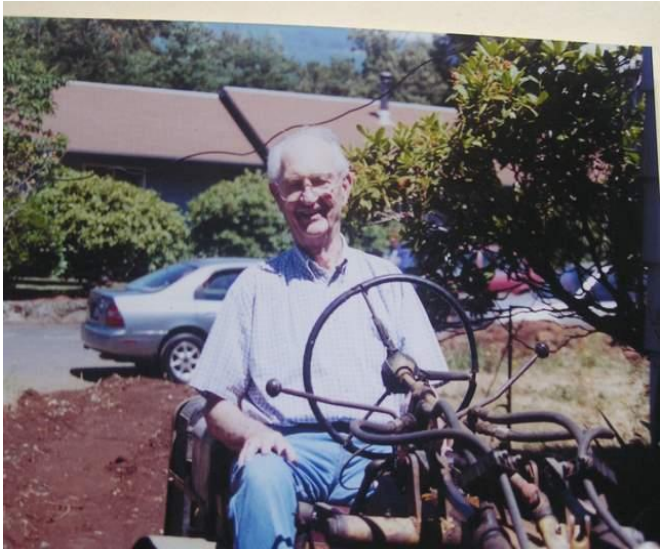


Figure 27 - Lawrence A. Waggener Jr. - US Forest Service, Retired - Engineer, Historian, and all-around "great guy"

Many of his 86 years seemed to vanish that day, as he put his creation back to work. What a wonderful man and what a wonderful treat for me to get to know him and to be able to put such a huge smile on Bud's face that warm summer day.

Very sad to say, Bud passed away in 2007; he is certainly missed by many. It was my distinct honor and pleasure to have known Bud and to have been able to call him my friend. Bud's son Robert is maintaining his father's historical records.

The original Beetle Tractor that I got from Buck Ober (#141) and Bud Waggener's R6 Trail Grader both now belong to Marv Hedberg of Rush City, Minnesota. Marv is an avid tractor collector, he attends many of the regional tractor shows, and guess what, Marv is yet another wonderful character. . You can see many of Marv's other toys in the picture section of the website known as Tracklayinggardentractors . To see the pictures you will have to join, but there is no down-side to joining, no fees, no spam, no garbage - just neat little tractors. (http://groups.yahoo.com/group/tracklayinggardentractors/)

Figure 28 - Bud Waggener's R-6 Trail Grader and Beetle Tractor # 141 on display at a show in Minnesota

The 16 year process of learning the story of the Beetle Tractor and the Clark Airborne crawler has been a fascinating experience, and while few people know the story I am hoping that this article will inform (and perhaps entertain) at least a few.

I currently have Beetle # 115 (one of the few narrow gauge tractors left and the second oldest Beetle known to exist) and # 142 (a wide gauge machine). I have reached the end of my research; the Ted Flynn Story has been told, and now it is time to move on. The only thing left is to negotiate the adoption of my two Beetles, making sure that their new owners will respect not only their unique qualities, but also their place in the history of modern equipment development

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