

Orchard Tractors

in

Santa Clara Valley

by April Halberstadt

240 South 13th Street
San Jose, California 95112
408/293-2860

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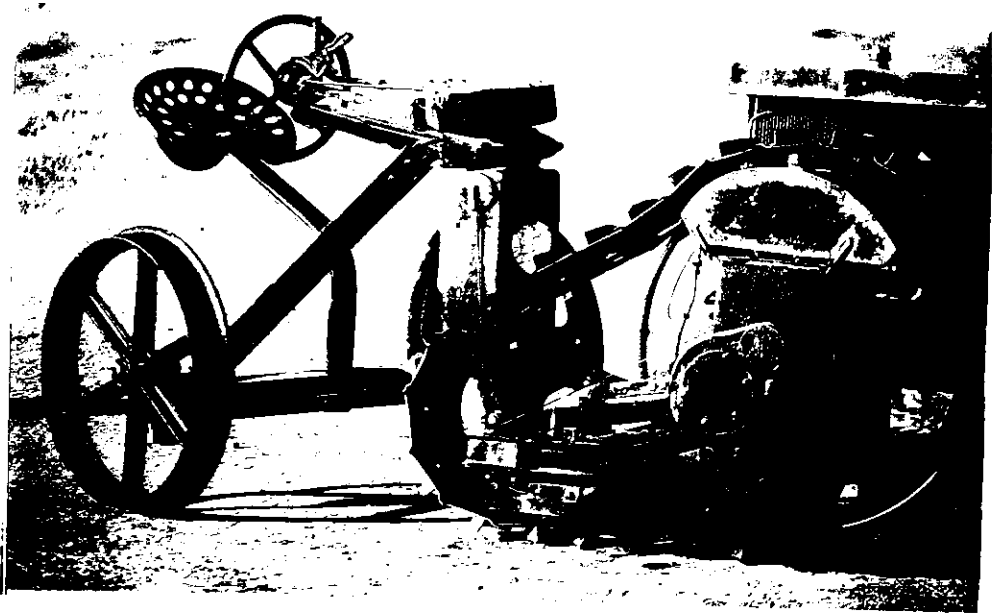
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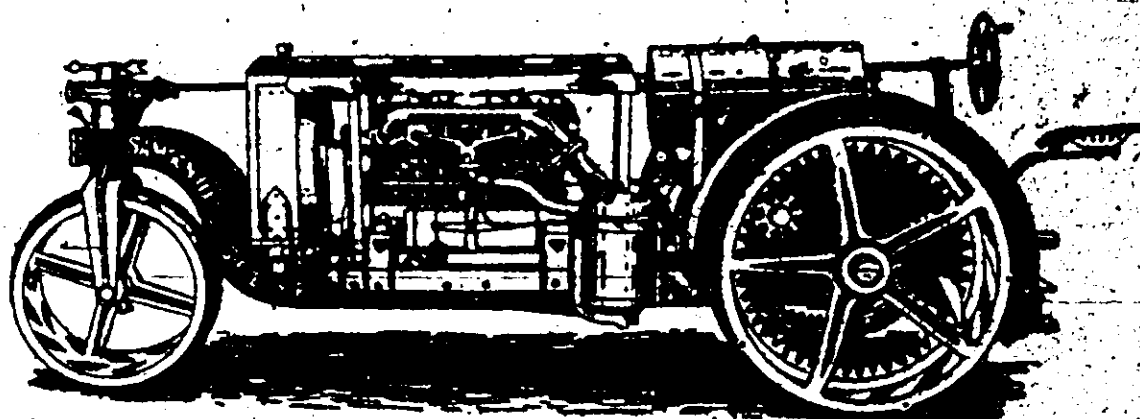
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1. Cultivating an orchard in the spring with Cletrac crawler-tractor . Hans Halberstadt photo.)



5. The **McCullough** machine, developed in the late 1920's for vineyard and orchard use. (Photograph by Hans Halberstadt.)



SAMSON
SIEVE GRIP
TRACTOR

The wheels get good traction and do not pack the ground.

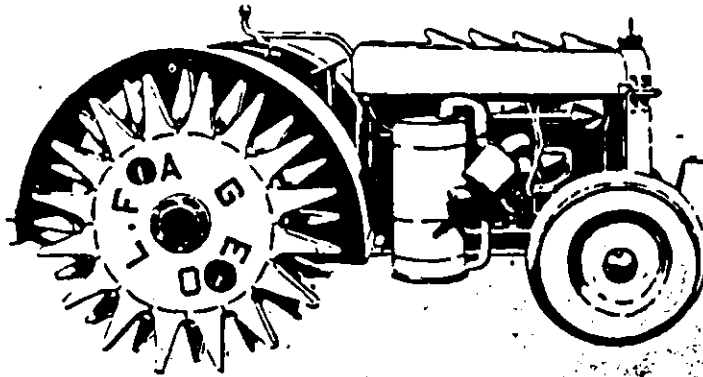
Harrison P. Smith, Inc.

First and San Carlos.

Phone 58.

6. Advertisement for the Samson Sieve-Grip Tractor from the San Jose, California *Mercury News* 1918.

FAGEOL TRACTOR



A CALIFORNIA PRODUCT
(MADE AT OAKLAND, CAL.)
USED AT TRACTOR SCHOOL

Elk Grove---January 6 to January 8, 1919
Lincoln---January 27 to February 8, 1919

Under the Auspices of State Board of Education

The Tractor That Walks

Esparto, January 8.
Capay Valley, January 9.
Blacks, January 10.
Yolo, January 11.

Grafton, January 13
Davis and Winters
Week Following.

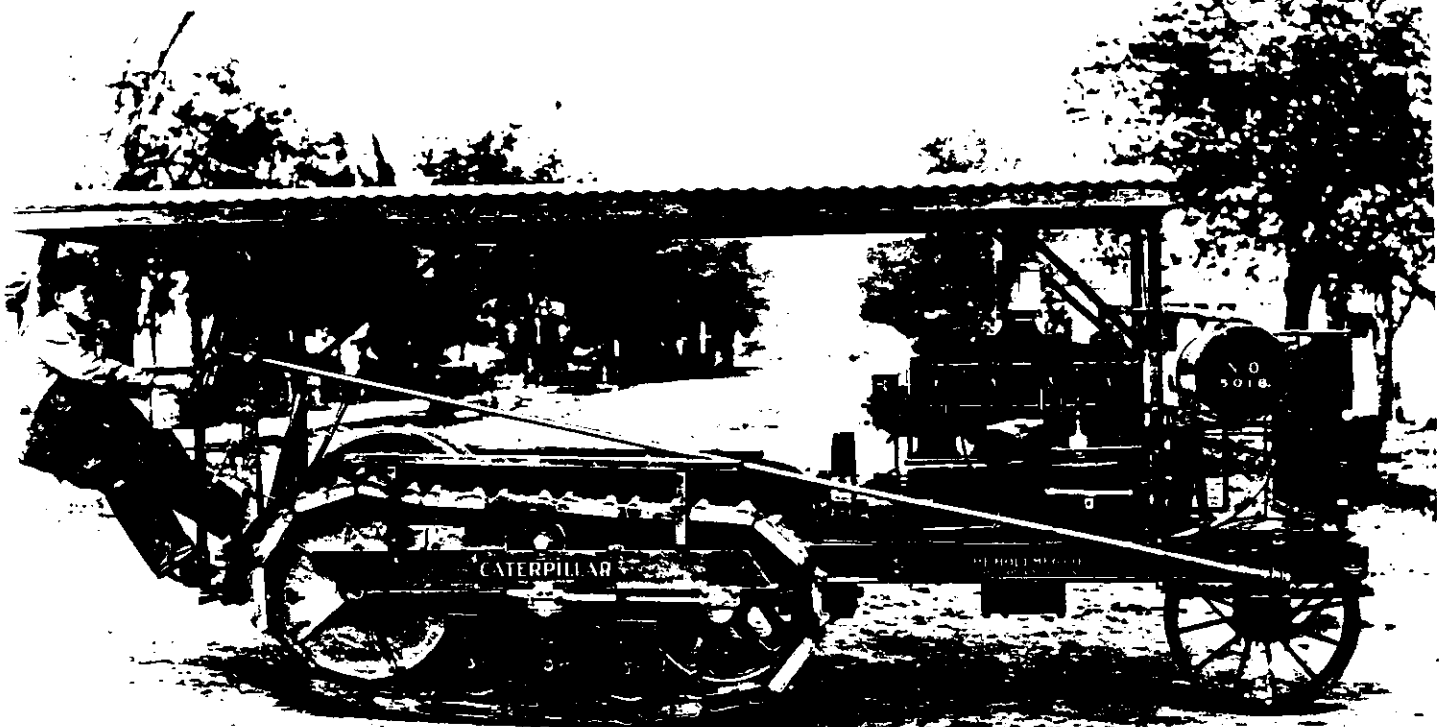
ELECTRIC GARAGE CO.

Phone 123

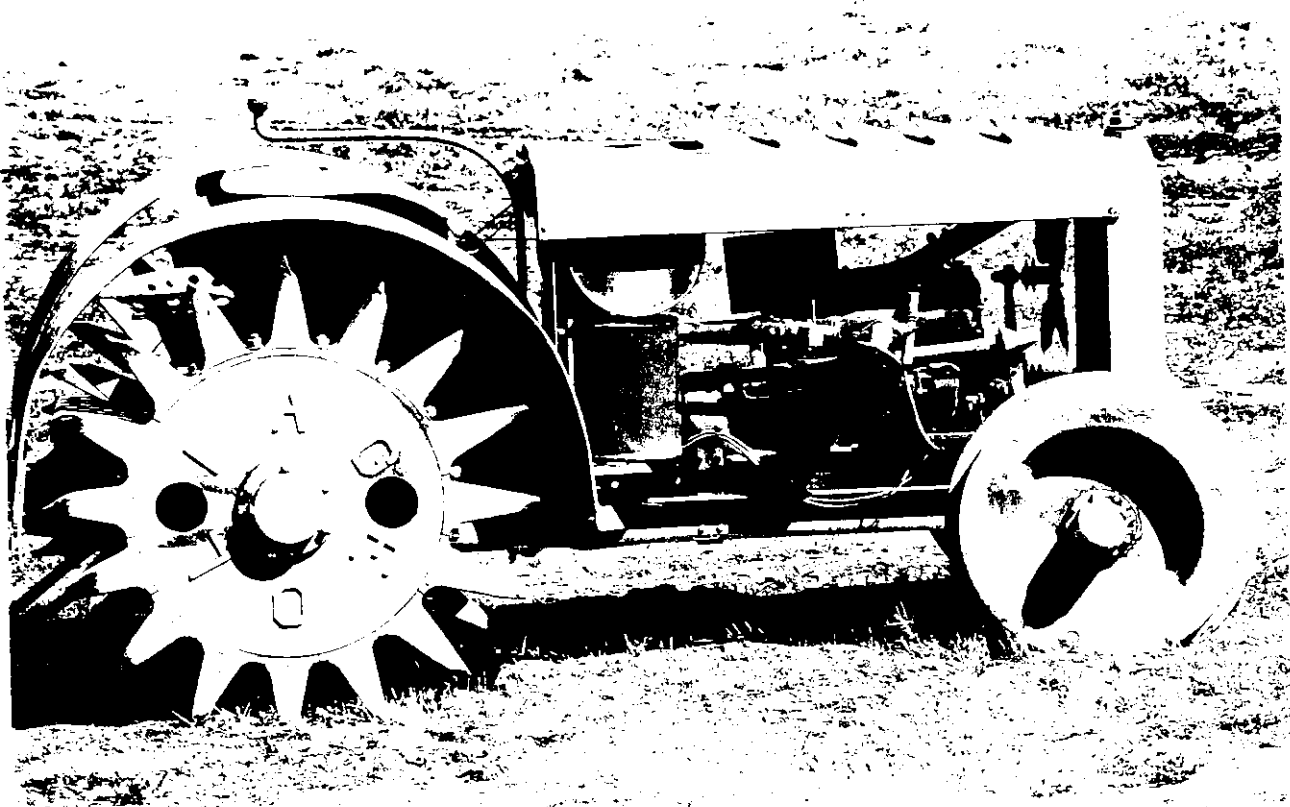
Distributor

801 Main Street

7. Advertisement for the Fageol Tractor from the Woodland, California Weekly Democrat 1919.



8. The **Caterpillar** "orchard tractor, produced circa 1912 for use in California orchards. (Picture reproduced from the Baldwin's Tractor Album.)
(San Jose Historical Museum photo.)



10. The Fageol tractor with its characteristic toothed wheels, tiller steering device and louvered engine vents. This machine is in the collection of the antique farm equipment museum in Vista, California. (Photograph by Hans Halberstadt.)

Orchard Tractors In Santa Clara County

Introduction

Santa Clara County was the fruit growing center of California at the turn of the last century. The Valley of the Heart's Delight provided fresh, dried and canned fruit to markets across America. Peaches, pears, plums, cherries, apricots, strawberries and prunes, prunes, prunes were the primary fruit crops, all grown in spectacular abundance. Walnuts too became an important local orchard crop. But fruit is an expensive crop to produce because it is so labor intensive to cultivate and harvest. Orchards need constant attention and the fragile fruit needs to be hand picked to remain blemish free and marketable.

Santa Clara County orchardists were very interested in any developments that would help mechanize their fruit production. By the turn of the century many other California crops, especially the small grains such as wheat, barley, and oats had already submitted to the economies of mechanization. Steam-powered mowers, reapers and threshers to cultivate and harvest were available to farmers who could afford them.

But Santa Clara orchardists have a unique cultivation situation. Conventional horse-drawn cultivating tools easily damaged the vulnerable, low-growing

orchard branches. Steam-powered tractors were too large and clumsy for orchard work. So several local inventors and machinists worked to develop traction machines...tractors, that were specially suited for use in orchards and vineyards. The Fageol tractor, the TrackPull, the Bean tractor and the Johnson tractor were just a few of the machines developed by important Santa Clara County inventors. Nearly forgotten today, these extraordinary machines and their inventors not only increased orchard productivity, they would also eventually help provide critical development for mechanical improvements in food processing and canning machinery. These tractors and the men who invented them merit our special attention and they are the focus of this discussion.



24 Spraying with Caterpillar tractor.
(San Jose Historical Museum photo.)

California Agricultural Innovation

California inventors have been in the forefront of leading technologies since the Gold Rush days. The early gold mining engineers, and then the silver mining industry quickly imported the finest pumps, mining tools and hydraulic technology from around the world. The mine owners could afford the best and they had it shipped in, as quickly as possible. With the equipment came the men who could assemble, maintain and repair these steam boilers, hydraulic pumps and drilling machinery.

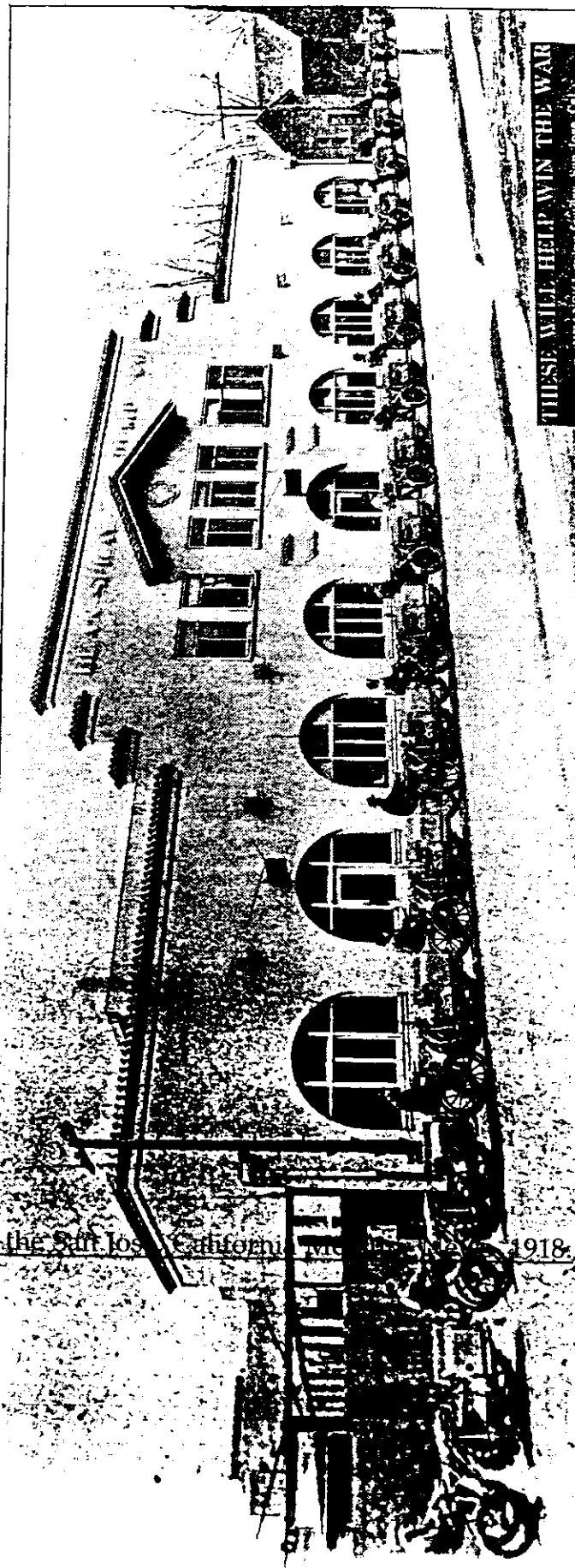
The port of San Francisco and especially the port of Stockton became important centers for foundries and metal fabrication and repair. The construction and improvements to steam equipment on the West coast paralleled similar innovation in the east. Construction of local California railroads in the 1860's and subsequent completion of the transcontinental railroad in 1869 would also provide a supply of experienced mechanics, machinists, boilermakers and steam engineers to the Bay and Delta regions of California.

So it is not surprising to discover that California inventors were among the earliest adapters of steam-driven machinery for farming. One of the earliest recorded wheat harvests anywhere with the newly developed mechanical

San Jose Mercury Herald

SAN JOSE, CALIFORNIA: SUNDAY MORNING, FEBRUARY 24, 1918.

SAN JOSE FACTORY BRINGS CREDIT AND FAME



THESE WILL HELP WIN THE WAR
17 "BEANS" leaving factory, San Jose, Cal.

3. Bear Tack Pull Factors from the San Jose, California, view, 1918.

fact at Los Gatos in manufacture it with the help of Dr. C. C. Crounse, who married his daughter, Adele, to such was the origin of the factory which, since it was shipped to San Jose in 1917, has become the largest spruce pump factory in the world.

The trees liked the California climate, but the scale liked it better and went sparse, worse than rabbits and thrips, to the alarm of James E. C. who fortunately for his people amongst posterity, was also

ature), it must also be, in a much larger proportion than before, factories, the turn out just exterminators and other factory-made goods that otherwise will buy.

have no remembrance here what Carralling the Past. And it says much for the Indis-

combine-harvester took place at Mission San Jose in 1854.¹ The combine would quickly become adapted for steam power. Both of the pioneer crawler tractor builders, Benjamin Holt and Daniel Best, were from the wheat growing region of the East Bay. The Best Agricultural Works, established in 1884, would become headquartered in San Leandro, California.

Another pair of early traction engine pioneers, James and William Paterson of Stockton, California, built and patented a working gasoline powered tractor for the J. I. Case Company of Racine, Wisconsin as early as 1894.² And finally, by 1892 the Best Company of San Leandro would be building gasoline motors for the street cars of San Jose, providing power for the cars of the rail line that ran along the eight mile stretch from Santa Clara Street to Alum Rock.³ California developers were certainly in the forefront of mechanizing agricultural technology. There seems to be little personal information about most of these technology pioneers. However we can begin trace them through what we know of their work.

¹ The Grain Harvesters, Quick and Buchele, p.91.

² Full Steam Ahead, David Erb and Eldon Brumbaugh, p. 101.

³ Benjamin Holt and Caterpillar, reynold Wik, p.49

Development of the American Tractor Industry

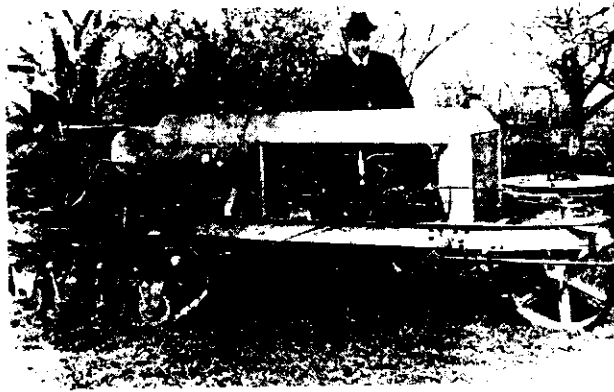
In order to appreciate the importance of the contributions of Santa Clara County tractor innovation, we should look quickly at the developers of the tractor industry in the United States in general. The first gasoline-powered production tractors would appear in the midwest in 1902, developed by Charles Hart and Charles Parr.⁴ Today the Hart-Parr Company is officially recognized as the "Founders of the Tractor Industry". Gasoline powered autos were already appearing in California in 1902 and when Henry Ford introduced his relatively inexpensive Model T in 1908, gasoline-powered machinery would receive widespread interest, use and acceptance. Gasoline engines for agricultural tractors would parallel development in gas-powered automobiles.

Although acceptance of gasoline-powered machinery was widespread, there were only about 600 gasoline powered tractors in the United States by 1910 and the majority of those were built by the Hart-Parr Company. There were several reasons for the comparatively slow adoption; the widespread use of traditional horse-driven and steam-powered agricultural equipment, the relatively low power and efficiency of gasoline machinery compared to the giant 60hp to 100hp steam machines, and the cost.

⁴ Oliver Tractors, Robert N. Pripps, p. 25.

But the major American agricultural machinery builders had been watching the success of the Hart-Parr machines and saw the market potential. They quickly began buying and developing tractors of their own. In just a few years there would be hundreds of tractor builders in America, each machine with something unique to offer. In the long run the giant agricultural machinery builders; Avery, J. I. Case, John Deere, Hart-Parr, International-Harvester and others would dominate the tractor marketplace. But during the years between 1910 and 1920, there would be dozens of companies formed to produce tractors. California was just part of the overall trend.

World War I and the general condition of the American economy would also have an impact on the tractor industry. These two factors would have a very direct impact on tractor innovation in California. The entire output of the Holt Manufacturing Company of Stockton, builder of the Caterpillar® tractor, would be dedicated to providing tractors for the army. This would leave their primary competitors, Daniel Best and his son C. L. Best of San Leandro free to push ahead in agricultural crawler tractor development. Just after the war a very depressed American economy would have a terrible affect on the farmer. Henry Ford had just introduced his new Fordson tractor in 1917 and quickly had thousands of tractors in inventory. In order to his sell tractors he was willing to cut his prices, selling tractors at a loss in order to keep his factories open. Other agricultural tractor builders, especially International-Harvester also cut prices to stay in



4. The **Wight-Lipe** orchard tractor with two unidentified gentlemen, presumably its proud developers. (Photograph from the San Jose Historical Museum collection.)

competition. This price war would put tractor prices as low as \$395 for a Fordson, pushing most smaller builders with more expensive machines from the marketplace. The San Jose built Fageol tractor would become one of these casualties.

Orchard Production Has Unique Requirements

Although the agricultural machinery industry was quick to produce a safe, reliable tractor for general farm use, the giant equipment builders were not as quick to recognize the specialized needs of orchard and vineyard farmers. It may be because the major builders were all located near the wheat and corn belts of the Midwest: headquartered in towns such as Racine, Wisconsin; Chicago, Illinois; Detroit, Michigan and South Bend, Indiana. And it may be because the production of small grain crops already had a long tradition of increasing mechanization, starting with the planters, mowers, harvesters and combines of the 19th century. In any case, specialized implements for orchard use seemed to be limited to the adaptation of plows and horse-drawn cultivators. There were few machines of any type available for the orchardist. The only common agricultural machinery in regular use on Valley farms seemed to be the stationary engines used for irrigation pumps.

Orchard traction machinery, or tractors as they came to be called, presented a unique set of requirements to tractor makers. The machines had to be very low in order to clear overhanging branches and to cultivate as closely to the tree

trunks as possible. The machines had to be light in order to prevent crushing the fragile root systems that were frequently close to the surface of the soil. Since many orchards were irrigated, the soils were frequently soft and sandy, quickly miring the conventional tractor with steel wheels.

Orchard tractors should have all mechanical parts and exhaust pipes enclosed in order to prevent snagging on trees. The driver's seat should be low in order to protect the operator from being hit by limbs. A substantial number of orchards were located on hillsides, difficult terrain for many conventional tractors. And finally vineyards added an additional caveat, they had very narrow rows, making it nearly impossible to operate the average tractor.

Santa Clara County inventors were aware of the challenges and developed some interesting and unique machines to meet the needs of Valley growers. Today these machines remain only in the possession of interested collectors. An important part of the technological heritage of Santa Clara Valley, they should be specially prized as unique artifacts.

Fageol Tractors

Scarce as hen's teeth, the toothed driving wheels on the fabled Fageol tractors. Reports vary about the number of traction machines actually produced and the years of production. Guesses say it was built only three or four years, 1917 to 1921. Some estimate only a few hundred were ever made. Manufactured primarily as an orchard machine, only a handful have survived.

Perhaps 100,000 vehicles a day drive by the old Fageol Tractor Factory in San Jose. But probably only 10 people in town know its exact location; and maybe five of those folks actually care. The old brick factory still stands near the freeway on-ramp at Highway 101 and 13th Street. The building is intact but it is now difficult to recognize since it is the middle of a sandwich a refrigerator warehouse added at each end. The site now includes a heavily used freight scale for truckers.

The Fageol tractor factory was located in San Jose, but the Fageol Corporation headquarters was in Oakland, California. The Fageol product line included primarily trucks and buses, although the Fageol brothers also built luxury autos and tractors. Fageol trucks and buses made an important and long-lasting contribution to the American transportation scene. The heavy-duty Fageol truck was a work-horse lumber hauler; it would later become the Peterbuilt Truck Company. And the Fageols' developed the "parlor car" bus, the touring bus used by Peerless Stages and the Gray Line sightseeing tours. The bus business eventually moved to Kent, Ohio and the Fageol motorcoach contribution lives on today in the Safety Coach and Twin Coach trademarks.

The Fageol brothers were noted for their engineering expertise and their sales ability. Their company had the reputation for being innovative yet solid, a good organization with important products. The little Fageol tractor would fail to meet expectations but the reasons probably had little to do with engineering or

design. In 1917 Henry Ford introduced the Fordson, a tractor about the same size that cost half as much as a Fageol. Hart-Parr had their extraordinary Model 12-25 tractor in the field and the rugged, reliable Case cross-motor tractors had first appeared in 1916. Competition and pricing quickly took the Fageol tractor out of the showroom and onto the scrap heap.

The Fageol boys, Frank and William, were from Ankeny, Iowa. (Ankeny is located between Des Moines and Ames.) Like many midwestern farmboys of that time, they were familiar with steam machinery. They liked to tinker with mechanical equipment, fitting steam engines to various vehicles. Historian Eli Bail reports that the brothers were so innovative that they built and operated what is said to be the first automobile in the state of Iowa. The brothers drove one of their inventions, an eight-passenger steam automobile at the Iowa state fair in 1899.

The Fageols would soon be offered a job and a sales territory; the chance to open the first Rambler dealership in San Francisco. The Fageol brothers were so confident of their mechanical abilities that they made a unique offer to anyone who bought a car from their establishment; they offered free maintenance for the first 10,000 miles. It was a sales incentive that drew attention.

San Francisco was a new market for vehicles at the time. An article in the May 11, 1902 Sunday edition of the *San Francisco Call* features a story about the City's one hundred seventeen autos and their "autoneers". There weren't many

auto owners in 1902, but “them folks as what had them, drove them.” One pair of enthusiasts, the article reports, had already run their new auto up and down Mount Hamilton in record time. Clearly the West Coast was taking to the new invention with a great deal of excitement.

While the Fageol brothers developed and produced some very inventive mechanical designs for motor coaches and trucks, the Fageol tractor was not their baby. It was however, such a promising and precocious infant that they were willing to adopt it as their own, buying the patent from designer Rush Hamilton around 1916.

The Official Gazette of the United States Patent Office from May of 1915 shows a little drawing of a Traction-Wheel device. A patent application was filed by Rush E. Hamilton of Geyserville, Napa Valley, California in December of 1914. A rare photograph of the original Hamilton tractor does not resemble the later production Fageol; the only identifier is the name “Fageol” painted on the front.

The Tractor Factory goes to San Jose

It’s not completely clear why the Fageol Tractor manufacturing business was located to the city limits of San Jose, but there are some reasonable guesses. We know the Fageol brothers had outgrown their Telegraph Avenue location in Oakland and were building a new manufacturing and assembly plant. An article in *Automotive Industries* magazine dated July 5, 1917 says, “Fageol Factory Started: To Be Built in Units for Manufacture of Trucks, Tractors and Cars”. At

the end of the article the directors of the company are named; L. H. Bill is president, Frank Fageol is manager. Directors of the company included the inventor Rush Hamilton, Dr. Arthur E. Hackett, William Fageol and Horatio W. Smith. Mr. Smith lived in San Jose and would probably be the key reason that the factory was built in a new industrial park on Old Oakland Road.

The new Fageol truck factory was being built on 108th Street in Oakland. Local residents know that the actual address was in an agricultural area now known as San Leandro. The plant remained for many years, becoming the Peterbuilt truck factory when the Fageol brothers eventually sold their truck operation to Peterbuilt.

Some knowledgeable sources theorize that Fageol would choose another location to built their tractors since San Leandro was already well known at that time as the home of another famous tractor builder, the Best Company. The Best Company and later the C. L. Best Traction Machine Company would be one the most outstanding designers of orchard cultivators and traction equipment.

Another theory is that a large order for new buses used all the available manufacturing space at the San Leandro plant and the company had to scramble around for extra space. Others point out that the railroad was located adjacent to the new San Jose site and it was easy to move heavy engines and other parts between the San Leandro plant and the San Jose location via the railroad.

The exact reason for the move is not clear, but we do know that a brand new factory with a brand new name, the National Axle Corporation, appeared in San Jose in 1920. The vice-president of this new business was Horatio W. Smith, one of the directors of the Fageol Company. Mr. Smith was a busy fellow and the Smith Manufacturing Company, a builder of boilers and other sheet metal products was located just 100 feet east of the new axle works. The San Jose business directories list Mr. Smith as the president of the Smith Manufacturing Company.

The Fageol Tractor

Why did Fageol decide to build a line of tractors? Well, every other auto builder was doing it! There was ample evidence that a different type of tractor was needed, one designed primarily for use in California's orchards. And even at that early date in tractor development, farmers already knew that orchard machines had a few unique design requirements. The Hamilton tractor did have deeply spudded wheels. The familiar saw-tooth wheels that identify a Fageol tractor would come several years later. The early Hamilton-Fageol seemed to be half tractor and half crawler, a toddler that was having difficulty deciding whether to run or crawl. But it looked like it had some possibilities.

It seems reasonable that a West Coast manufacturer like the Fageols' would want to control the local tractor market. The only real local competition was probably the Samson Sieve-Grip, a tractor designed in the Stockton area in 1914 that also

had spaded wheels for sandy soils. The Samson was bought by General Motors in 1917 as their entry into the tractor business; they were hoping to compete with the Fordson tractor. William C. Durant of General Motors moved production of the Sieve-Grip to Janesville, Wisconsin in 1918, but it would be no competition to the Fordson. By 1922 General Motors had abandoned the tractor business altogether.⁵ In the long run we now see that the Fageol's also would wait too long to put their machine into production, a costly delay that would doom their machine.

An article from *Automotive Industries* magazine shares the Fageol company's tractor manufacturing plans and their high hopes.

"The farm tractor which the Fageol people will build is the invention Rush Hamilton.

"Unlike either the caterpillar or broad wheel type of tractor, or the convertible automobile tractors in common use today, the Hamilton machine uses an entirely new principle for getting its traction. Instead of flattening the ground in front of the plow or harrow or other machinery being pulled, this tractor draws its farm implements along after having loosened up the soil by its front wheels with their long blade-like teeth.

"These blades or teeth on the front wheels of the tractor enable it to walk right over all kinds of ground, and owing to the fact of its being built very low to the

⁵ Encyclopedia of American Farm Tractors, C. H. Wendel, p.124.

ground, it is claimed the machine can go almost any place the farmer or orchardist wishes to send it."

The plans were changed by the time the machine went into production. A photograph of an early Hamilton tractor shows a machine that was articulated in the middle with spudded wheels providing traction. It says Hamilton on the radiator grille, but the name Fageol is clearly painted on the bonnet. It bears little resemblance to later machines.

Later versions of the tractor show the distinctive Fageol louvers in the hood, a feature of the Fageol trucks. The most obvious characteristic is as the distinctive wheels. Other innovations on the production Fageol tractor include a tiller rather than a steering wheel. The engine was reported to be a Lycoming 3 1/2 x 5in bore and stroke with one of the earliest replaceable air filters. There was only one forward gear.

Tractor technology raced ahead of the Fageol. Henry Ford was producing a lighter, cheaper tractor and was flooding the marketplace by the early 20's. Other tractor builders were also in the marketplace and the Fageol was too heavy, too clumsy and too expensive in comparison. Weighing in at 3,600 lbs with its enormous clunky wheels, the Fageol tractors were quickly outmoded and were only produced until 1923.

The National Axle Corporation was as short-lived as one of Silicon Valley's computer builders. National Axle became Great Western Motors around 1923

when Horatio W. Smith took over as president. The company is still listed as a tractor manufacturer in 1925 but the 1927 San Jose city directory is the last listing for either Mr. Smith or Great Western Motors.

The Fageol Tractor seems to be a rare machine indeed and only a few are known to exist. There are a few in private collections and there is one on display in the Joseph Heidrick, Jr. collection in Woodland, California just north of Sacramento. In Southern California one unique example has found a home at the Antique Gas & Steam Engine Museum located in Vista, California.

Other Tractors in Santa Clara Valley

The Yuba Ball Tread

Another California tractor that was used in Santa Clara Valley orchards needs to be mentioned. It was the Yuba Ball Tread tractor, built in Marysville, California. San Jose orchardists, such as the Lester family of Willow Glen, used Yuba tractors. The Yuba design was later copied and modified to produce the little tracked crawler built by the Cleveland Tractor Company, known as the Cletrac. The Cletrac too was sold in Santa Clara Valley for orchard use.

But the original design and refinements of the Yuba Ball Tread tractor can be credited to Clarence Henneuse, a fellow who worked at the C. L. Best Manufacturing Company in San Leandro. Henneuse sold his patents to a local inventor named Alfred C. Johnson. Mr. Johnson's name shows up in connection with many early local tractors and related agricultural equipment. But again it's

not surprising that all the early tractor builders knew each other in the days when there were just a few inventors and San Jose was a small town.

The Johnson Tractor

Alfred C. Johnson even developed a tractor that carried his name. Built at the Joshua Hendy Machine Works, the Johnson tractor was indeed developed by Johnson, an associate of Joshua Hendy. Alfred Johnson's residence is listed as Sunnyvale on some of his patents, Winters, California in others. It is not certain where his home was located since he is not listed in local directories with any regularity. It has been assumed that Alfred C. Johnson lived part time in the Sunnyvale area because he was kept on retainer by two local capitalists, W. J. Benson and John Bean.

An earlier orchard tractor design developed by Alfred Johnson is the TrackPull, a small single track machine more suited for vineyard work. The TrackPull patents were bought by John Bean in 1915 and the little machine was put into production during the war. An illustration in the local *San Jose Mercury News* for February 24, 1918 shows 17 Bean machines leaving the factory with the note "These Will Win The War".

But Johnson had all sorts of other ideas for orchard tractors and his ad in the California "Cultivator" of 1912 shows a tricycle tractor with one small wheel in front and two in the rear. The machinery is not enclosed or covered with any safety cowling. An advertisement for the Johnson tractor says the machine



The Tractor that will make Good in the Foot-Hill Orchards of the Santa Clara Valley must be a Good Tractor

The Johnson Tractor was developed in the Santa Clara Valley, and dozens of them are in daily use there. A visit to this district and an inspection of its clean, well-kept orchards will show the thoroughness of the work that can be done by a Johnson Tractor. Hot weather, the time when your trees need most attention, has no terrors for the Johnson Tractor. Day after day it will go right along while horses are dropping off in efficiency and trees dependent on horse cultivation are suffering because of lack of dust mulch.

But not all of the readers of Cultivator can visit the Santa Clara Valley. For those who are genuinely interested we have a practical working demonstration offer. It has always been the policy of this house to sell machinery on a satisfaction basis, and this policy includes the sale of the Johnson Tractor as well. Therefore, we are ready, and willing, to put a tractor on your land, and do your work until you are satisfied that it will successfully replace horses for cultivation, plowing, or hauling.

We do not ask you for one cent, as a deposit or otherwise, until it is fully proven that the Johnson Tractor will do your work.

In your first letter tell us the number of acres you work, the crops, and the character of your soil. If you are willing to give the tractor a fair trial, and buy it if satisfactory, write to-day for full particulars of our demonstration offer.

JOSHUA HENDY IRON WORKS

63 Fremont Street

San Francisco, Cal.

California Cultivator, 1912

9. The Johnson Tractor, reproduced from a newsletter by John Boehm. Original illustration from the *California Cultivator*, 1912.

would be demonstrated by a “factory expert” a fellow whose name turns out to be Henneuse.

Johnson had another design collaborator on some of his early efforts, Fred D. Calkins, also of Sunnyvale. The names of Calkins and Johnson appear together on two patents for internal combustion engines, filed in 1913 and 1914.⁶ But Johnson’s name is linked with other California tractors too. In 1919 Johnson is working for the Yuba Manufacturing Company and has assigned a patent to them. Johnson was also reportedly retained by San Jose auto dealer and investor W. J. Benson to develop mechanical devices. Johnson assigned a third of his design for an air-washer to Benson in 1914⁷ and another patent the following year.

The Bean Tractor

Produced by the Bean Spray Pump Company, this curious little machine is usually attributed to Alfred Johnson. According to an account in a book entitled *Growing Orbit*, the corporate history of The Food Machinery Corporation, John Bean bought the rights for the TrackPull from Alfred Johnson. The machine seems to have been produced during the World War I years but again only a few were built and there are only a couple known to be in collections.

⁶ Patent # 1,079,741 filed November 25, 1913 and patent # 1,097,166 filed May 19, 1914.

⁷ Patent # 1,120,818 filed 1914.

John Bean was an inventor and manufacturer from Michigan who retired to the Los Gatos area in the 1880's to grow fruit. Disturbed by an infestation of scale on his fruit trees, he bought a spraying rig from the local hardware emporium to deal with the pests. The rig only put out a drizzle and was nearly useless in dealing with the problem. So Bean built his own. His spray outfit was so successful that he was soon selling spraying equipment. In 1928 the Bean Spray Pump Company would merge with Anderson-Barngrover. Today we know the company as FMC, one of the most important builders of food processing machinery in the world. There are many photographs of the Bean Spray rig in operation, usually pulled behind a crawler tractor.

The McCullough Machine

Developed by J. H. McCullough, Jr. , this machine remains something of a mystery. It looks a great deal like the Bean tractor designed by Alfred Johnson, but the newer design has some startling refinements. The McCullough machine is much lighter and more compact and might have been an excellent machine for vineyard use. Again it is quite likely that timing may have worked against the introduction of this design. The design was patented December 10, 1929, patent #1, 738,784 and the machine greatly resembles the early Bean tractors. The Great Depression of the '30's was right around the corner, ending any possibility of financing a new tractor no matter how good the design might be. Few are known to survive; one restored model is in a private collection in Santa Clara.

Wight and Lipe Machine Works

This interesting early tractor was developed by two machinists whose business was located on South Market and Pierce Street in downtown San Jose. The design shows the characteristics of an orchard machine; a long, low machine with the operator's seat set low in the back of the tractor. The illustration was taken in 1918, when Robert J. Wight and Royal M. Lipe operated the Wight and Lipe Machine Company at 44-50 Pierce Street in downtown San Jose. Milton Lipe, who is also listed in city directories as employed in the company, lived right across the street at 93 Pierce. The business is listed as specializing in automobile, gas and steam engine and pump repair.

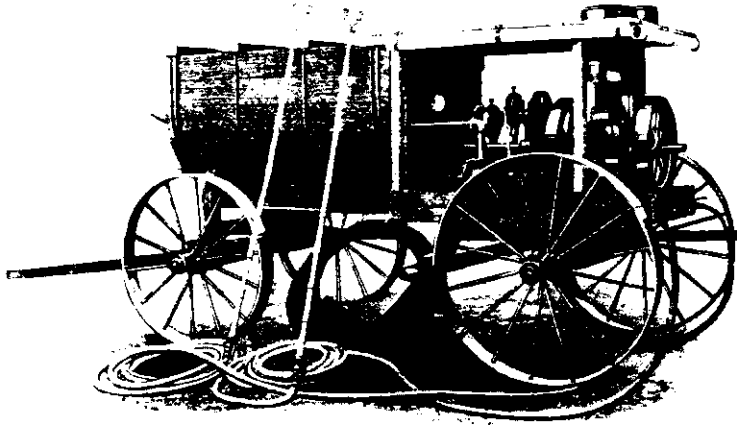
By 1922 the business was divided with Wight remaining at the boiler works on Pierce Street and Lipe operating a machine shop on The Alameda. He seems to have been a successful business owner with a home at 207 Martin Avenue.

It is very unlikely that the Wight-Lipe machine was ever put into production. Capital to build new tractors slowed to a halt just after World War I and Henry Ford would soon start selling his excess inventory at bargain basement prices. Only machines with large established manufacturers would survive.

Orchard Tractors after 1925

The early orchard tractor models and the needs of California orchardists actually did have an important impact on the tractor manufacturing business. Tractor builders quickly began to see ways to broaden their markets by modifying some

BEAN POWER SPRAYERS



Bean Giant Outfit 127 with 3-3½ horse-power Sprayer Engine and Optional Equipment. See details on pages 26 and 36

THE BEAN GIANT POWER SPRAYER

THE Bean Giant Power Sprayer was first offered to the public in 1907 and at once became the most reliable high-pressure, large-capacity sprayer on the market. In addition to all the advantages of former models the GIANT is this year equipped with an all-steel, instead of wood, platform, and many steel instead of cast-iron parts. These, with other improvements, make it more than ever the best and lightest large capacity Power Sprayer obtainable anywhere.

The GIANT SPRAYER with 2-2½ H. P. engine has capacity of 8 to 9 gallons a minute, supplying six of the very largest nozzles or 12 to 16 of ordinary type. With 3-3½ H. P. engine, 10 to 11 gallons a minute are supplied—more than sufficient to meet the demands of any orchard.

Every machine is tested above 250 lbs. pressure before shipping and will work at any point up to that limit.

The whole outfit is only 9 feet long over all and 4 feet 8 inches from ground to top of tank. The complete outfit, including truck, with 2-2½ H. P. engine, weighs only from 1600 to 1800 lbs., according to equipment, and with the 3-3½ H. P. engine from 1800 to 1900 lbs.

The GIANT is exceedingly light, compact and easily handled in densely planted, wet or hilly orchards.

11. The Bean orchard sprayer, weighing "only" 1800 lbs. Tractors were needed to pull devices like this. (Page from Bean Company catalog, Halberstadt collection.)

of their models. By the late 1920's the major builders, J. I. Case, Deere and others were offering tractor models in three sizes plus a rowcrop model. They soon discovered that they could create an "orchard" tractor by covering the wheels and engine compartment and lowering the driver's seat. The John Deere Company called their orchard tractor a "California Special" and examples exist only in photographs.

McCormick-Deering seems to have had an orchard tractor in production since 1923 and the Cletrac (Cleveland Tractor Company) was already advertising their orchard crawler-tractors in the *San Jose Mercury News* in the early 1920's. Today the orchard tractors, any and all machines, are highly prized and sought after by collectors. And the early orchard tractor technology, the crawler tractors and the engineering that developed around orchard equipment, would eventually evolve into the Food Machinery Corporation. Now known as FMC, this company manufactures both military tracked vehicles and food production and processing machinery. Santa Clara Valley engineering technology has been on the leading edge for nearly a century.

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- Assistance from librarian Bob Johnson at the California History Room, San Jose Public Library.
- Assistance from archivist Cecelia Mullin, Special Collections, San Jose State University She was instrumental in locating the photograph of the Fageol factory from the Gordon collection.
- Information and inspiration from Charles Hopkins and Bill Traill, collectors and enthusiasts.

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