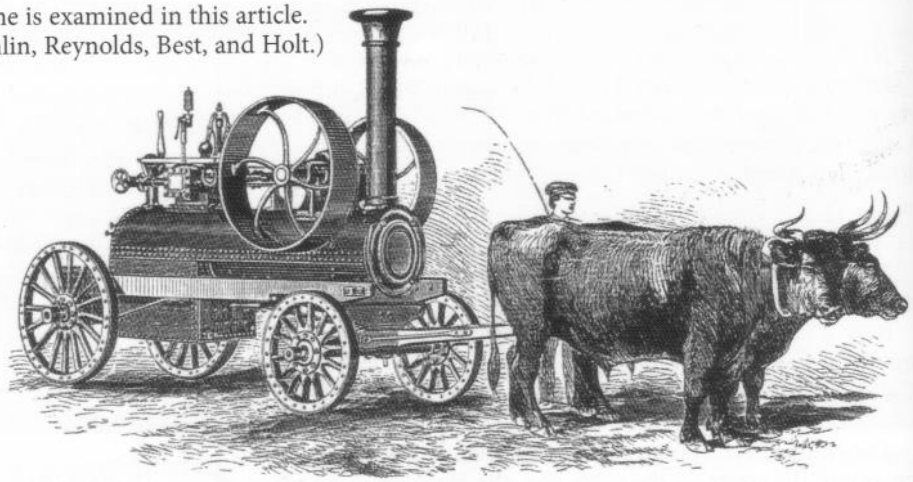
Why So Many California Engines Look So Much Alike

By Robert T. Rhode

Several center-crank agricultural engines in California in the late 1800s closely resemble one another. The explanation for the similarity—and the story of manufacturing steam engines for California's farms—dates back to the time of the Transcontinental Railroad.

(Only a certain class of center-crank farm engine is examined in this article. Not represented are such companies as McLaughlin, Reynolds, Best, and Holt.)

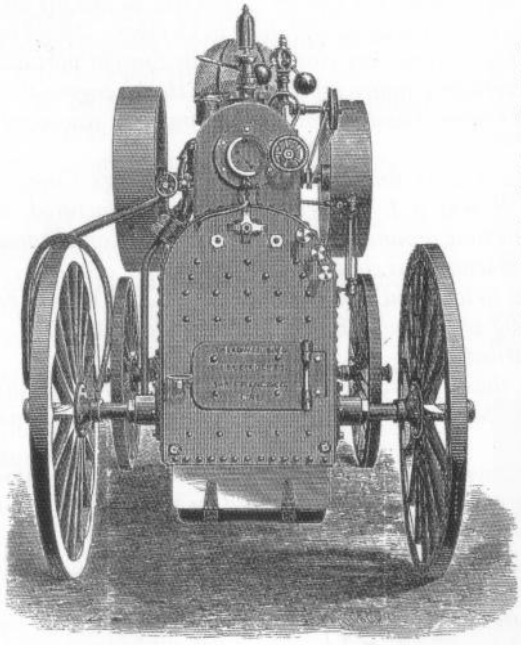
President Abraham Lincoln signed the Pacific Railroad Act on the 2nd of July in 1862 to help prevent the West from forming a separate union. Businessmen from Sacramento became principal backers of the railroad project, which received generous federal subsidies. On the 10th of May in 1869, the Union Pacific and Central Pacific railroads met at Promontory Summit in the Utah Territory. Cameras recorded iconic images of the ceremony when Leland Stanford and others drove the golden spike to complete the first Transcontinental Railroad. Not until late November of that year were the connections finished that made San Francisco the ultimate destination of the lines of steel linking the East Coast to the West.



15 HORSE POWER.

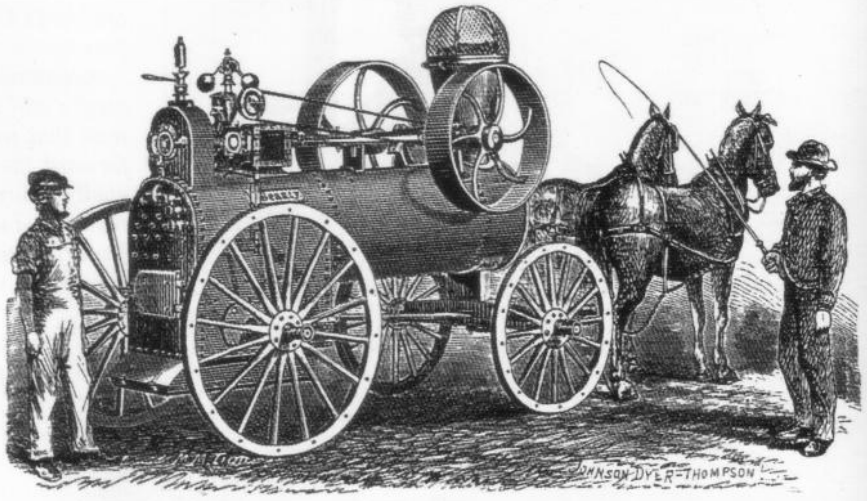
Evidence suggests that this illustration depicts the design of portable engine Massachusetts factory owner John Chipman Hoadley was shipping to California as early as 1861. The cut, or engraving, appeared in a Hoadley catalog dated 1870.

Among the eastern industrialists who gleefully contemplated the exploitation of western markets was John Chipman Hoadley, head of a steam engine factory in Lawrence, Massachusetts. (For more about Hoadley, see the two articles that Bruce Babcock and I wrote about the engine trials at the 1881 Cincinnati Industrial Exposition; they are posted at http://roberttrhode.org/Recent_Articles.html.) While the final ties were laid in San Francisco, Hoadley prepared a thick cata-



10 Horse Power,—Engine "Beauty."

Hoadley built this portable at his factory in Lawrence, Massachusetts, and advertised it in his 1870 catalog. The firedoor reads "Treadwell & Co., sole agents, San Francisco, Cal." Completed in 1869, the first Transcontinental Railroad made it possible for Hoadley to transport engines from one coast to the other in about a week—far less time than the months required to ship engines around the tip of South America, as Hoadley had been doing since 1861.



10 Horse Power,—Engine "Beauty."

Here is a side view of one of the 10 HP engines Hoadley sent by rail to Treadwell.

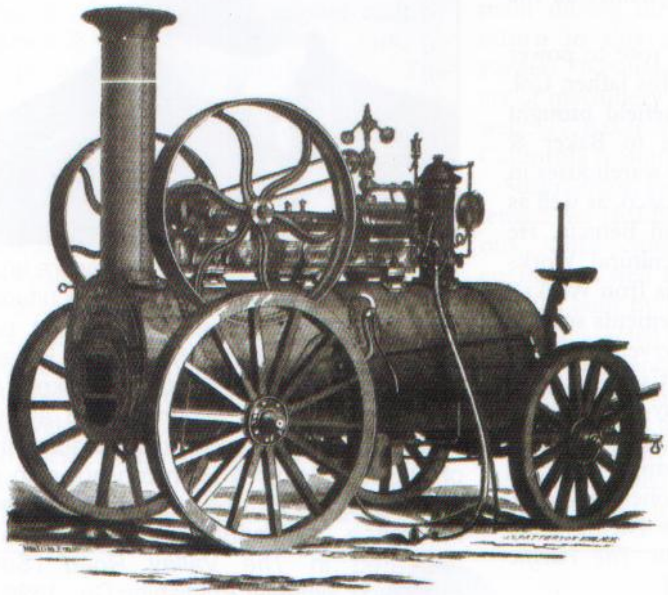
log advertising his engines for 1870 and proclaiming his partnership with Leonard L. Treadwell of Treadwell & Company in San Francisco to sell Hoadley engines with the Treadwell name cast in the firebox door. Hoadley had been shipping engines to Treadwell since 1861, but the Transcontinental Railroad promised to make transportation of finished farm engines much easier. Writing for *American Industries* for May 1st in 1905, California Governor George C. Pardee said, "The building of the Central and Union Pacific railroad, which brought California within a week in time of the Atlantic seaboard, opened a new era, and the first effect was not favorable to many of the local industries which had flourished because of the isolation of the country and of a comparative absence of competition. The railroad made low through rates and Eastern products poured into San Francisco, Sacramento and other towns in which manufacturers had thriven. Where formerly it had taken months to order and deliver Eastern-made goods, the time was now reduced to two or three weeks. To make the effects of this competition more severe, California was lacking in good fuel, insomuch that first class bituminous coal cost from $6 to $10 a ton and anthracite from $10 to $20. All of the iron and most of the hard wood were also to be imported. Nevertheless, local manufacturers of machinery, of clothing and of boots and shoes held their own fairly well, in spite of all disadvantages, and California industry is strong in these lines even to the present day. With the rise of fruit-growing the canning industry soon became important, and the large wheat production stimulated flour milling."

Much of what remains to be understood about Californian farm engines will follow along the lines of Governor Pardee's observations.

In 1869 and 1870, Hoadley was not the only eastern industrialist with high hopes of capitalizing on the first Transcontinental Railroad. On the 9th of October in 1869, Henry M. Ames entered into a partnership with Isaac L. Merriam and Leonard Ames to expand the business of the Ames Iron-Works in Oswego, New York. Page 173 in the *History of Oswego County, New York* (Philadelphia: L. H. Everts & Co., 1877) said, "They manufacture both stationary and portable engines, but their specialty is the latter. This establishment has formidable competitors throughout the country in the manufacture of portable engines, but the novel features of the engine built at these works have commended it to the public, and they now manufacture three hundred annually, and shipments are made to all nations. Employ one hundred and eighty men."

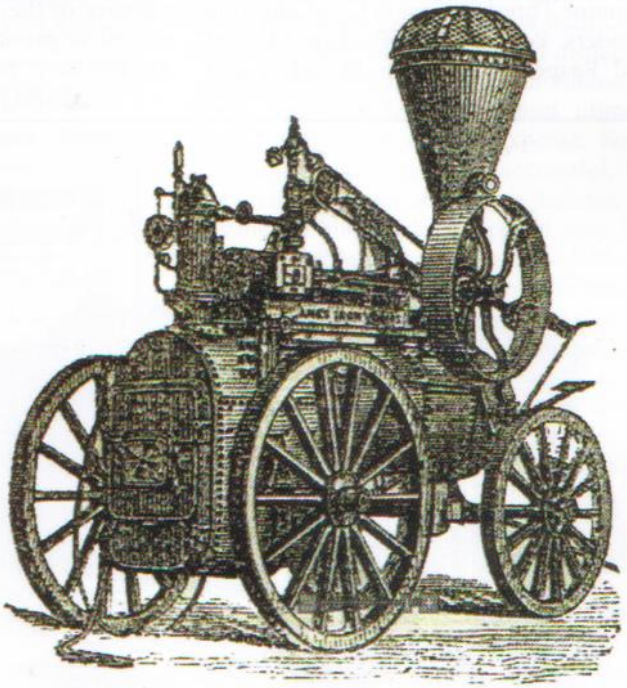
Both the Hoadley engines and the Ames engines were of center-crank design; it is my view that such machines predisposed California builders to prefer center-crank engines.

In the same way that Hoadley found Treadwell willing to distribute engines from his warehouse in San Francisco, Ames found the same city's Baker & Hamilton amenable to the idea of marketing eastern engines to western farmers. In the 1870s, Baker & Hamilton also sold the center-crank Wood & Mann portables. In



The huge warehouses of Baker & Hamilton in California sold this Ames engine, built in Oswego, New York. This detailed cut appeared in *The Pacific Rural Press* for the 26th of June in 1875. Henry M. Ames shared Hoadley's hopes for profits at the western end of the rail line across the continent. Indications suggest that Ames enjoyed abundant returns for his shipments of engines to Baker & Hamilton.

As evidenced by this postal card, Baker & Hamilton sold both return-flue and locomotive boilers equipped with Ames engines.



Hampson, Whitehill & Company, with works producing saw and grist mills at Newburgh, New York, published an advertisement with the same cut of an Ames engine as seen in the Baker & Hamilton postal card but more clearly presented.

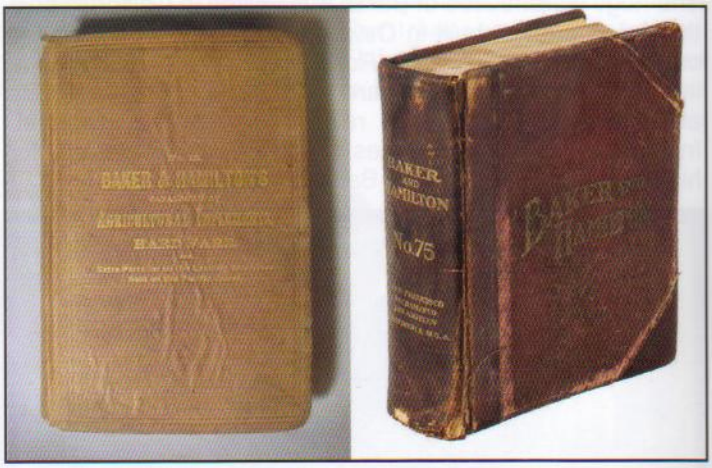
San Francisco, Sacramento, and other rapidly developing cities of California, vast warehouses displayed eastern goods disgorged from freight trains. While many states had important distribution centers for agricultural equipment, the California warehouses were particularly significant in strategic sales of Hoadley engines and Ames engines.

Pen Portraits, published in San Francisco in 1878, described Baker & Hamilton, which began in Sacramento: "This firm consists of L. L. Baker and Robert Hamilton, and is one of the pioneer houses in the ... agricultural implement trade, having been started in 1853 ... and dealing in seeds, agricultural implements and other useful articles necessary for the proper tillage of the soil. ... Understanding perfectly the wants of the country, they have been able to furnish the farmers on this coast a better variety and better class of machines than can be found in any other place in the world. The firm have increased their stock to such an extent that they now occupy more warehouses and storerooms than any house in the city. ... They have constantly on hand all kinds of agricultural implements and farming tools, as well as the largest stock of shelf hardware to be found on the coast. They are exclusive agents for many of the standard machines, which are well known by many of the farmers, such as the Ames' Straw and Wood-Burning Engines, Pitts' Genuine Thresher, Case & Co.'s California Headers, Bain Wagons, Buckeye Mowers and Reapers, Champion Mower[s] and Reaper[s], Hollingsworth and Tiger Rakes, Althouse and Raymond Wind Mills, and many other machines they have control of for this coast. The firm, in 1868, ... opened a house in San Francisco, which has prospered much more than they at first expected. They still further advanced their business by establishing a factory at San Leandro [Sweepstake Plow Company] for the manufacture of gang plows, harrows, cultivators, and such other goods as can be manufactured at a profit on this coast. Their two houses are now doing a very large business, with sales of nearly $2,000,000 annually. They employ ... some 20 clerks and men about their stores; in San Francisco, almost double the number. At their factory they employ an average 50 mechanics all the year through."

When Wakefield Baker rose to power in the business begun by his father, Col. Livingston L. Baker, Wakefield brought even greater prominence to Baker & Hamilton. He oversaw the warehouses in Sacramento and San Francisco, as well as others in Los Angeles and Benicia. He headed the Benicia Agricultural Works (later known as the Benicia Iron Works), which manufactured implements sold by Baker & Hamilton. He served as president of the Pacific Portland Cement Company, and, like so many industrialists of his generation, he directed several banks and insurance companies. He was a member of the famous Bohemian Club, as well as president of the Pacific Club. An obituary published in *The Pacific Dairy Review* for December 11th in 1913 said, "As the head of the big firm whose business extended all over the coast, and whose hardware and farm implement trade is a part of the equipment on nearly every farm, dairy and creamery in California, Mr. Baker was one of the big business men of the coast. ...

The importance of the large hardware and implement stores in the sale of agricultural steam engines in California cannot be overly emphasized. Wakefield Baker became vice president of Baker & Hamilton when his father passed away. Wakefield quickly assumed the leadership of not only Baker & Hamilton but also a host of other businesses, banks, and insurance companies. This portrait appeared in *The Valley Road* (San Francisco: Wheeler Publishing Co., 1896).

This ad depicting Baker & Hamilton's gigantic warehouse dates to the late 1890s and visually underscores the significance of such warehouses in supplying farmers with steam engines and related machines.



Headed first by father Livingston L. Baker then by son Wakefield Baker, the Baker & Hamilton warehouses and related businesses constituted a tremendously profitable firm meriting massive annual catalogs. At the left is the 1879 volume; the catalog at the right dates to approximately 1910. Warehouses played a strategic role in disseminating farm steam engines throughout the vast, rich valleys of California.

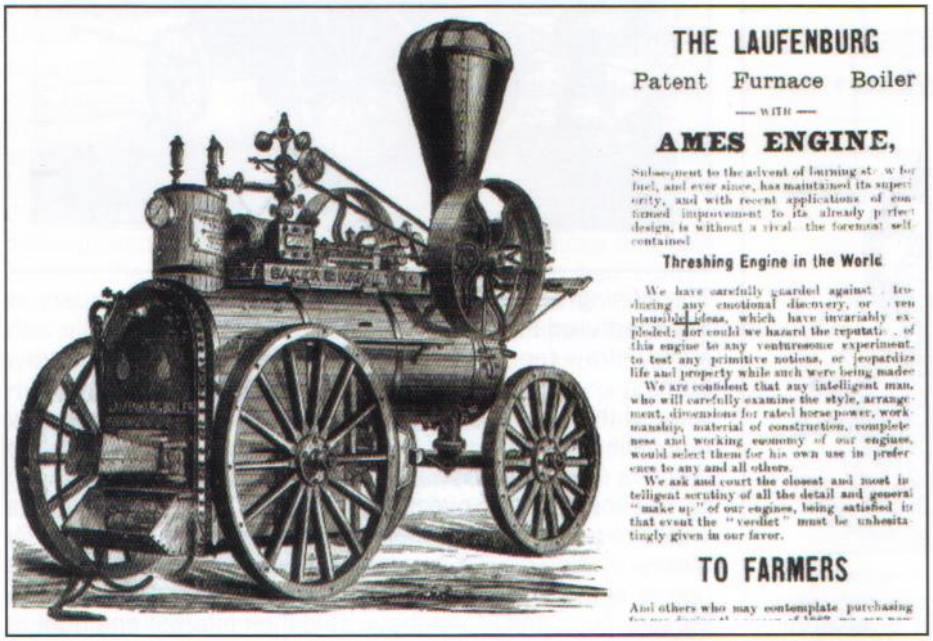
Wakefield was educated at Exeter Academy and Harvard University. Immediately upon graduating from the latter institution his father died and shortly after occurred the death of Mr. Hamilton, with the result that young Wakefield Baker was forced to take the management of the business, which during his twenty years he has kept ahead of all rivals as the largest wholesale hardware and implement house on the Pacific coast."

The front page of the *Sacramento Daily Record-Union* for the 3rd of June in 1875 reported, "The well known importers and dealers in agricultural implements, Baker & Hamilton, who are always wide awake to the wants of farmers, and as wide awake to supply those wants, have had a large number of … straw-burning engines built by Ames & Co., of Oswego, New York, … expressly for this market. … The straw-burning boilers are of the return flue pattern … and will burn either straw or wood." In the late 1870s, Baker & Hamilton brought about a fortunate pairing of Ames engines atop straw-burning, coal-burning, wood-burning, and even oil-burning boilers patented by Michael Laufenburg of San Francisco. Such machines carried the Laufenburg name cast in the backhead and the Baker & Hamilton name cast in the bedplate, but the engines themselves were brought in by rail from the Ames factory in New York. The Benicia Agricultural Works produced later models of essentially the same engines featuring the Benicia name on the bedplate.

Californian warehouses encountered the Panic of 1873, which signaled the beginning of what became known as the Long Depression, a decade of financial woes that only the strongest and smartest firms survived. (For more information on the Panic of 1873, see my article posted at https://drive.google.com/file/d/0Bx4w_jRRMBwYaXNzYTdEX0xZU2M/view.) Some scholars have theorized that the panic was not felt in California until after mid-decade. Treadwell limped along through the mid-1870s, but Marcus C. Hawley & Co. took over sales of Hoadley engines in 1878. Baker & Hamilton appeared to have relatively few difficulties when it came to selling agricultural equipment during the Long Depression. We return to this comment by Governor Pardee: "Nevertheless, local manufacturers of machinery … held their own fairly well … ." Baker & Hamilton was one such California manufacturer.

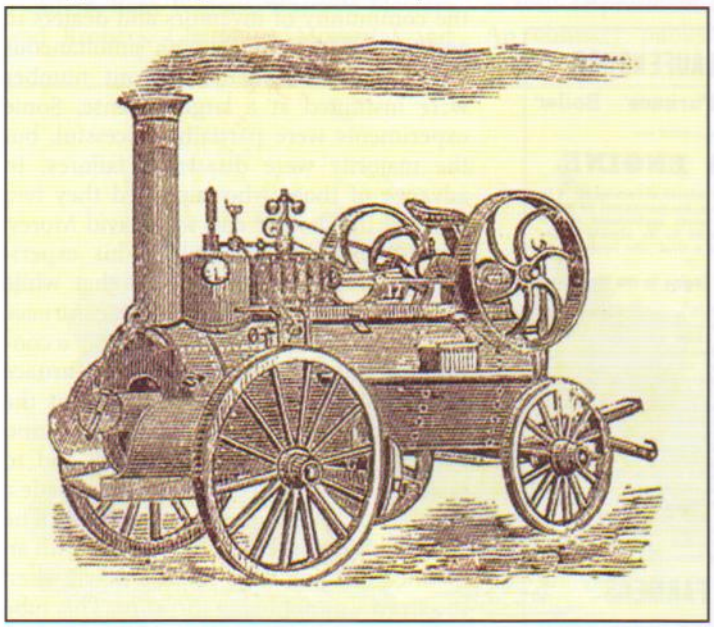
Surprisingly, local manufacturers challenged the Hoadley engines and the various Ames composite (or assembled) engines, as well as many other imported engines built by such firms as J. I. Case, Payne (marketed through H. P. Gregory & Co. of San Francisco), Russell, and Gaar, Scott & Company.

Page 5 the of *Sacramento Daily Union, Sacramento Daily Record*, for January 27th in 1877 presented this fascinating account, so useful to my topic that I have quoted it at length: "The discovery of the possibility of burning straw safely and successfully as a fuel for portable engines used to furnish motive power for thrashing grain was one of the utmost importance and value to the farmers of this State generally, but to none more so than to those of the San Joaquin valley. A vast area in this valley which is yearly sown in grain is utterly devoid of timber, and in fact wood is scarce enough throughout its whole area. The demands of home consumption have thinned out the grand old oaks that dot the plain and relieve the landscape in the immediate region of Stockton, and the additional drain that the farmers have been obliged to make upon them by using wood for thrashing purposes bade fair in time to utterly denude the valley of what little timber was growing upon it. When they found, however, that owing to the ingenuity of our indefatigable inventors they were furnished with the secret of making straw serve their very purpose, our farmers felt, one and all, a great relief. Straw in the thrashing field was a burden, and the necessity of disposing of it was considered by many of the improvident class such a nuisance that they were accustomed to burn it as it lay in the field. By making it serve as a fuel they effected the double purpose of getting rid of it economically and saving the cost and trouble of procuring other fuel. As necessity is acknowledged to be the legitimate mother of invention, so this glaring necessity of utilizing straw as a fuel seemed, about four years ago, to impress itself upon the community of inventors and dealers in agricultural implements with simultaneous force, and experiments without number were instituted at a large expense. Some experiments were partially successful, but the majority were disastrous failures. In advance of those who supposed they had attained the desired end was David Morey, of Watsonville. The result of his experiments was to evolve the idea that while straw required to be fed into the furnace almost constantly in order to keep up a continuous fire, yet the door of the furnace needed to be kept closed to shut out the cold air that would rush in over the fire and cool off the flues. With this idea, and to facilitate the feeding of the straw, he made a square tube with a revolving door, which he afterwards modified to an oval tube with an inclined hanging door to drop down when the straw was not being thrust in. This tube was adjusted to the aperture corresponding to the door in an ordinary furnace. With this appliance attached to a Hoadley, or fire box boiler, he made an experiment in the streets of Watsonville which was considered a grand success. A high pressure of steam

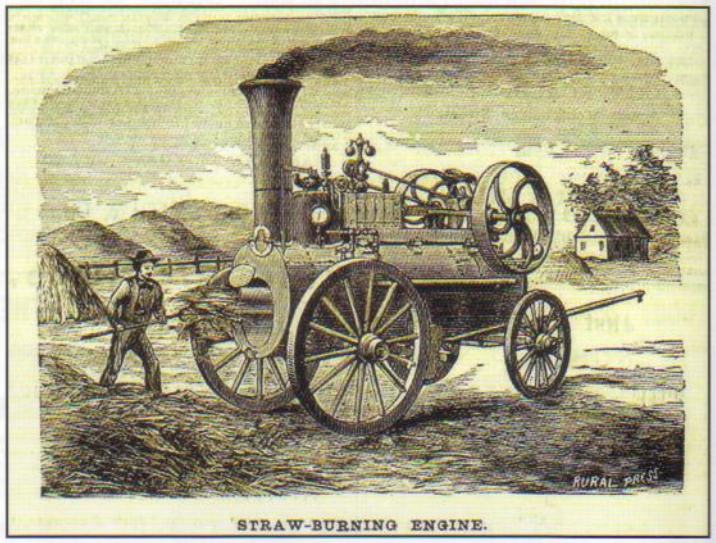


The Pacific Rural Press for the 19th of May in 1883 carried this cut promoting the advantages of a Baker & Hamilton portable consisting of an Ames engine atop a boiler by Michael Laufenburg. Later models of essentially the same engine carried the name of Baker & Hamilton's Benicia Agricultural Works in Benicia, California.

was maintained for a number of hours. He was congratulated by all his friends, and it was thought he had perfectly solved the problem. He obtained two patents for his tubes and their application, dated respectively February 11th and May 20, 1873. Having made this discovery, his next object was to introduce it to the world. With this end in view he went to San Francisco with his tubes to make a public trial of them. Not finding the proper conveniences in the city, he went to Hayward and to the machine shop of Harvey W. Rice, where he solicited the privilege of putting his straw-feeding device upon one of Mr. Rice's engines. Mr. Rice had for years been experimenting in the construction of a fuel-saving boiler which he considered new, but which proved to be but a facsimile of the old Cornish return-flue boiler, constructed on the principle of passing the flame and products of combustion twice through the water by returning flues before allowing their escape through the smokestack, thus economizing the heat and more thoroughly consuming the carbon of the fuel. One of these boilers was set up in the shop to run the works, and it was to this form of boiler that Mr. Rice desired to make the straw-burning attachment. Morey protested, having made his experiments with the ordinary fire-box boiler, and knowing nothing of the comparative innovation of return-flue boilers. Rice, however, prevailed, the attachment was made, and in March, 1873, Mr. Morey invited representative agricultural implement dealers, members of the press and others to witness a trial of his straw-burning attachment. The trial proved a satisfactory success. The machine shop was kept running with the straw alone quite successfully, and a glowing account of the discovery was published shortly after in the *Rural Press*. There had been then two successful experiments with either class of boilers and Morey's feeder, but when Mr. Morey placed his fire-box boiler with the feeder attachment in the field the ensuing season, the result was far from satisfactory. The steam required to run a separator could not be maintained, and the whole thing was considered a failure after repeated trials. Knowing this result, Mr. Rice, with all faith in his form of boiler, and the principle it involved, fitted one of his portable engines with the Morey feeder and went into the field. The result was eminently satisfactory. The boiler, with straw as its sole fuel, supplied all the steam required under all circumstances for thrashing grain. The combination of the feeder with that form of boiler proved to be the lacking element of success in the burning of straw, and this combination was luckily discovered by Rice. Having made arrangements with Mr. Morey for the use of his invention, Mr. Rice took out letters patent for the combination [Number 146,614] January [20], 1874, and got a reissue May 4, 1875 [Reissue Number 6,422]. So marked was the success of the invention that the Rice combination patent was purchased by Messrs. M. C. Hawley & Co., who, in the past two years, have sold large numbers of the machines, which have, in fact, superseded every other in the market to such an extent that ten straw-burning engines are now sold to every one of the wood or coal burners. But success in a patented machine is sure to beget jealousy and an envious desire on the part of other inventors to share in the lucrative profits which naturally follow its demonstrated capability and value. It was so in this case. The dealers in agricultural implements, too (in this State and presumably so in other localities), are markedly jealous of each other, and each firm uses every means in its power not only to prevent the others from gaining an advantage in any particular point, but to put themselves on an equal or superior footing to the others in the possession of any desirable article in general demand. As could have been naturally expected, then, no sooner did Messrs. Hawley & Co. put the improved straw-burning engines into the market than other straw-burning return-flue boiler engines, of almost identical patterns, appeared in the field in

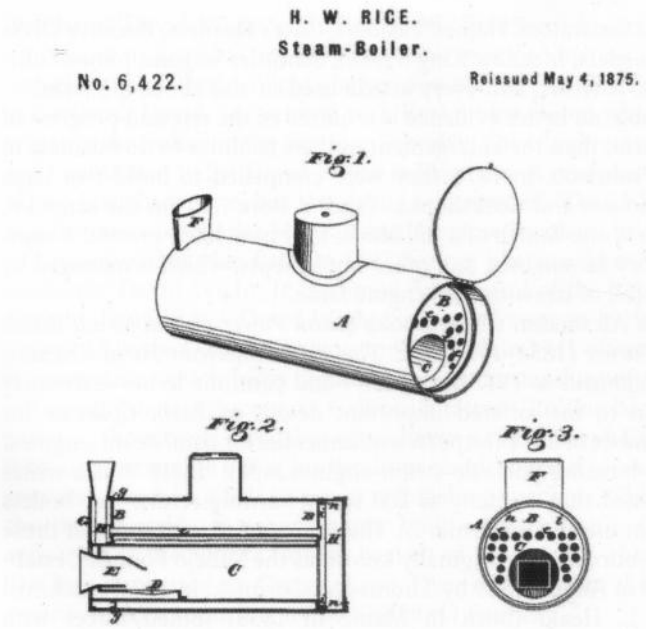


In 1876, Harvey W. Rice, who had designed a straw-burning boiler and engine for which the Ames boiler and engine were said to comprise a virtual "facsimile," sued John Loring Heald over a Heald patent that Rice alleged was an infringement of his own patent; in 1877, a jury agreed that Rice's patent had been infringed. Here is Rice's engine.



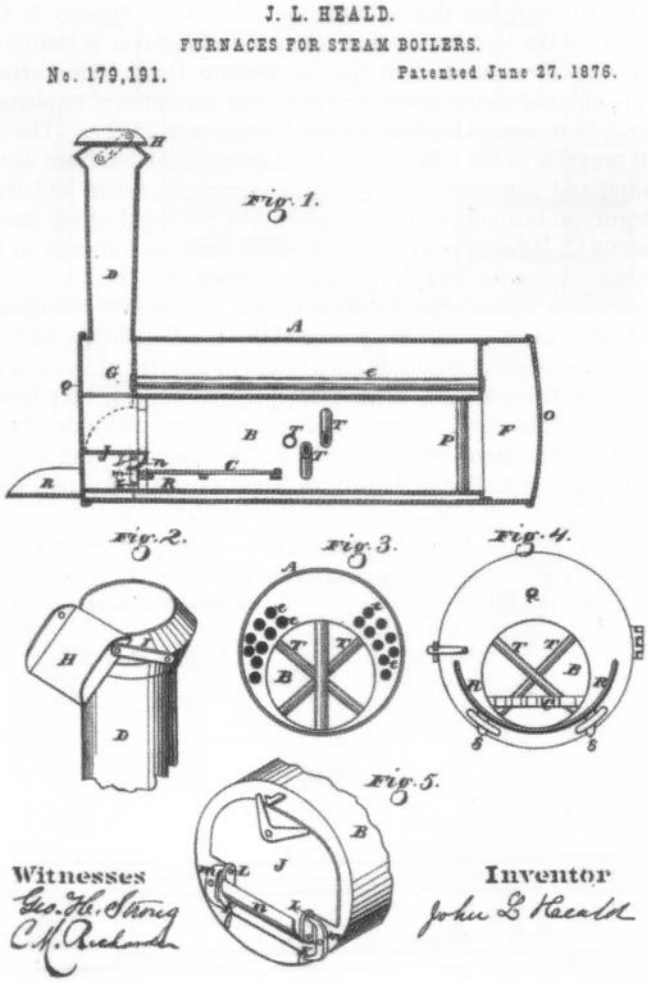
STRAW-BURNING ENGINE.

The *Mining and Scientific Press* for the 5th of February in 1876 featured this illustration of an 18 HP Rice portable with Morey straw feeder. The accompanying article said, "Straw burning engines for steam plowing and threshing are considered the latest improvement in agricultural machinery by our valley farmers ... . There were about forty of these engines at work in the State during the harvest of 1875. Mr. H. W. Rice ... made over one-half of this number. But for his experience and experiments, in connection with Mr. D. Morey, of Watsonville, our farmers would probably not have had a straw burning engine at work in this State yet. ... Messrs. Rice and Morey have sold their interest and right to make these engines on this coast to Marcus C. Hawley & Co. ... . They are making arrangements to manufacture a large number of the Rice straw burning engines for the season of 1876, as every engine manufactured last year found a ready sale, although the crops were light."


H. W. RICE.
Steam-Boiler.
No. 6,422. Reissued May 4, 1875.
Fig. 1.
Fig. 2.
Fig. 3.

This is Rice's patent, which was reissued in May of 1875. Writing in the *Mining and Scientific Press* for February 19, 1876, C. Z. Sanders said, "We shall all agree in saying that all honor is due Mr. Rice for the energetic measures that, in conjunction with others, he has taken to bring to a successful issue his idea of an engine that shall burn straw alone for fuel, and yet lose not one whit of its power or usefulness. But we are naturally led to inquire, is Mr. Rice alone in the field, or are there others that deserve honorable mention ... ? I think there are, and first and foremost among the claimants stands prominently forward the name of Mr. Enwright [sic], of San Jose. It is nearly ten years ago ... since the idea occurred to Mr. Enwright that it would be just as feasible to use steam power with threshing machines as to use steam power in a sawmill ...; whereupon, without adequate means, without proper tools, and with the whole voice of the community against him, does he at once set to work to build his engine. That it would never do, that it would set everything on fire, that farmers would never allow it inside their fences, that it would be the foolish fellow's ruin, of course everyone agreed to, but in spite of all this, Mr. Enwright built his engine, and after a good deal of persuasion, a farmer allowed him to try it with his grain, the builder being responsible for the damage it might do. The result, of course, is well known; horse-powers were at a discount at once, and those that had laughed the loudest, now were the wisest, who had always known it would prove a good thing. Since that time Mr. Enwright has built a large number of engines, which compare favorably with others, either imported or those of home manufacture. Of course they all burned wood. Within the last two years this enterprising gentleman has turned his attention to straw burning engines, and last year a number of them were doing very good work in the harvest field. ... Then there is a firm of builders that has recently started at Salinas, in the manufacture of engines that are to burn straw. I refer to Brown Bros. These gentlemen, within the last few years, left their home in Australia, and have settled down in this State, as offering the best advantages and the surest returns for capital invested of any country they have ever seen. They have bought extensive grounds at Salinas, and erected a large two-story building, where they mold their own castings and do their own work generally. Already they have built some eight or 10 straw burning engines, which have given eminent satisfaction ..."

competition. Baker & Hamilton, their most influential rival, sold the engines made by the Ames Machine Works of Oswego, New York, which were the facsimile of the Rice straw-burning engines. Joseph Enright, of San Jose, and John L. Heald, of Vallejo, each appeared before the market with engines of the same general character. To evade the combination on which Rice's patent was based, a mechanical equivalent for the Morey feeder was substituted and a direct infringement ingeniously evaded. To defend his rights Mr. Rice, on the 12th of January, 1876, instituted a suit against John L. Heald in the United States Circuit Court, before Judge Lorenzo Sawyer, to recover damages for the infringement of his patent. That suit, which has been pending just a year, was recently tried before a jury, and after a long contest, lasting through eight days, was decided on the 1st instant in favor of the plaintiff, Mr. Rice. Much interest was taken in the suit by agricultural implement dealers, as well as by inventors, and particularly by Baker & Hamilton, as agents for the Ames engine, and by Joseph Enright, all of whom joined Mr. Heald in defending the suit, as they were directly interested in the result. The decision fully vindicates the rights of the patentee and establishes the validity of the patent. The case was one of the most important ones ever decided in that Court, and will long be remembered as a representative of that class of cases. It was shown in the trial very conclusively that Mr. Rice was the first who ever made a success of the burning of straw in a return-flue boiler for thrashing engines, all other attempts at burning straw having been made

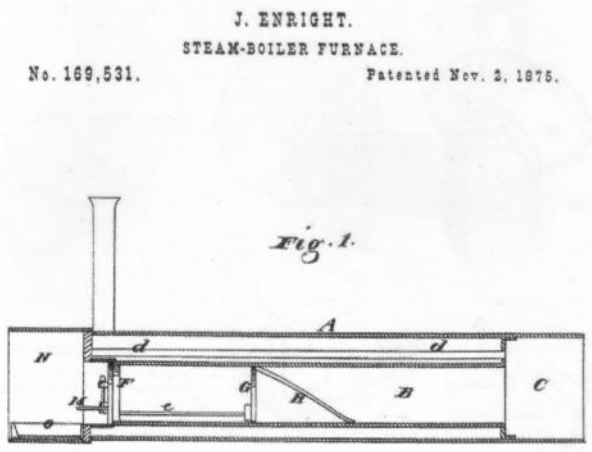

J. L. HEALD.
FURNACES FOR STEAM BOILERS.
No. 179,191. Patented June 27, 1876.
Fig. 1.
Fig. 2.
Fig. 3.
Fig. 4.
Fig. 5.
Witnesses
Inventor
John L. Heald

In January of 1876, Rice brought suit against Heald for infringement of patent. Here is Heald's patented boiler design from June of the same year.

with fire-box boilers. While Mr. Heald used nothing but a shelf before the door as an equivalent of Morey's feeder, yet he used that in combination with the return-flue boiler and the result was the same, the shelf, simple as it was, being a mechanical equivalent for the tube or feeder of Morey and Rice. It very often happens that wealthy but unscrupulous men will succeed in defrauding an inventor out of his rights by ingenious mechanical substitutes for his invention. The power of their wealth discourages him from making resistance in the Courts, and he is usually obliged to accept the wrong, with as good grace as possible. The decision of this case should convey a lesson of caution of the danger of attempting to imitate or circumvent a patented invention by employing known mechanical equivalents for that invention, however changed they may be in form or shape, and it is for the sake of giving this caution that we have cited the case at so great length."

It is impossible to miss a central implication in the *Sacramento Daily Union* story: namely, that the Ames engine was a "facsimile" of the Rice engine and that the engines of Heald just to the north of San Francisco and those of Enright just to the south of the same city were "of the same general character." We need search no further for definite proof that the center-crank engines of a general class for farming purposes in California in the 1870s and thereafter were modeled on one another. (I will attest to the fact that, depending on the camera angle and other circumstances, a historic photograph of a Heald engine can trick the viewer into mistaking the machine for an Enright engine and vice versa.)

Pen Portraits has this to say about Marcus C. Hawley & Co., another of the warehouses that competed with Baker & Hamilton; Hawley was mentioned in the *Sacramento Daily Union* article: "This old and well-known hardware and agricultural implement house, commenced business in San Francisco in 1852 .... The rise and progress of the house of M. C. Hawley & Co. has been astonishing, and conclusively shows what enterprise, talent and strict integrity in business will accomplish. The principal of the firm is Marcus C. Hawley, who resides in New York, and attends to the buying, paying for, and shipping of all goods. The business in San Francisco is managed by the other partners, Walter N. and George T. Hawley. In 1874, in consequence of the demands of the business of Northern California, the branch house was started in Sacramento .... In addition to [the firm's principal warehouses] they have a large warehouse on L. street ... where are stored all kinds of agricultural implements and utensils, Rice's straw burning engine, Gaar, Scott & Co.'s and Hoadley's wood burning engines, Gold Medal Separators, Haines' Headers, Case's Headers, Buckeye Drills and Seeders, Meadow King Mower, Schuttler wagons, plows, cultivators, harrows, and every article used in and about the farm. ... Probably no better evidence is required of the rise and progress of this firm, than the enlargement of their facilities to do business in San Francisco. In 1876 they were compelled to build two large warehouses and workshops ... [and] a store ... . On the same lot, which is one-fourth of a full block, they have lately erected a manufactory for engines, and other implements, which is managed by Mr. Rice, of straw-burner engine fame."


J. ENRIGHT.
STEAM-BOILER FURNACE.
No. 169,531. Patented Nov. 2, 1875.
Fig. 1.

In November of 1875, Joseph Enright received a patent for his straw-burning boiler design.

Jack Alexander, whose books *Steam Power on California Roads and Farms (1858–1911)* and *The First American Farm Tractors: Developments to 1917* have been—and continue to be—extremely helpful to me, offered important details in *Farm Collector* for November of 2011 (http://www.farmcollector.com/steam-engines/straw-burning-portable-steam-engines.aspx): "By 1878, one writer suggested that as many as 200 straw-burning return-flue boilers were in use in California. ... The source of at least some of those straw-burners was originally known as the Vallejo Foundry, established in August 1869 by Thomas McCormick. In 1871, machinist John L. Heald (born in Maine in 1835) joined forces with McCormick and the business became known as the Vallejo Foundry and Machine Works. By 1874, Heald had bought out his partner. In 1875, Heald began building portable straw-burning threshing machine engines. By 1879, the enterprise employed a staff of 20. [See *History of Solano County*.] Two years later Heald began construction of a new facility in Crockett, Calif., where he'd relocated his foundry, machine shop and agricultural works. At the new facility, he manufactured boilers, stationary and movable engines, threshing machines, separators, grape crushers and pressing machinery, roller-crushing barley mills and, in 1889, a steam traction engine. In 1891, Heald sold his plant to Dunham, Carrigan & Co., San Francisco. [In the late 1890s, the Hawaiian Sugar Refinery took over the plant.] Heald won his first U.S. patent (no. 179,191) June 27, 1876, for a straw-burning boiler. That patent was challenged by H. W. Rice as an infringement on straw-burning boiler patents he'd been awarded in 1874–75. In January 1877, a jury decided in favor of Rice. Heald and Joseph Enright of San Jose, Calif., subsequently developed a straw-burning boiler that did not infringe upon the Rice patent. Their boiler was patented March 11, 1878 (no. 203,253). Production ramped up quickly. Within a year, *The Pacific Rural Press* reported that Heald was building 15 of his improved straw-burning portable steam engines at his Vallejo shop." Recently, Jack restored a Heald portable, as may be seen in Jack's *Farm Collector* article.

Among the facts that Jack reported, the most significant for our purposes are that Heald's factory was small, numbering only 20 workers, and that Heald and Enright joined forces to patent a boiler that escaped infringing the Rice patent. As we have noted, at exactly the same time, Ames employed 180 workers. The fact that a contemporary photograph of a Heald engine has survived to find its way into John F. Spalding's collection is remarkable, given what must surely have been a small production number of Heald engines.

Several additional details amplify our knowledge of Heald's and Enright's enterprises. John Loring Heald, whose experiments with "progressive heating boilers" were widely reported, was elected to the California Assembly (1873–75). As Jack Alexander mentioned, Heald sold his plant in 1891, only two years after he had expanded the Crockett factory. Heald passed away in Almagordo, New Mexico, in 1912. Like Heald, Joseph Enright was born in 1835—not in Maine but in County Limerick, Ireland. At some point prior to the publication of the 1890 San Jose city directory, Wight &

Branham (David Wight and Charles M. Branham) became the successors to Enright's foundry and took over production of the Enright engine. David Wight's father, also named David, was born in Scotland; David, Sr., worked with Enright for eleven years and was superintendent of the San Jose Foundry. The city directory for 1892 continued to list David Wight & Branham as manufacturers of the Enright engine, but the listing was worded "David Wight and the estate of Charles M. Branham" because Branham had died in January of that year. Later in 1892, former pharmacist and horticulturist David Wight, Jr., assumed full control of the business. Enright died in 1897. David Wight, Sr., passed away in 1919.

Page 13 in the *Oakland Tribune* for July 13th in 1941 offered this retrospective, which helps complete our understanding of steam power on nineteenth-century California farms: "Rolling back the years ..., the records show that an Irishman named Joseph Enright took a steam engine out of his Petaluma shop, bolted it to a wagon gear and attached a belt to power a threshing machine. This was the first portable thresher engine built on the Pacific Coast, appearing in the Sonora County harvest of 1861. A Mr. Huyck of San Jose purchased an Owens, Lane, Dyer & Co. steam thresher engine in I860, according to the *California Farmer* ..."

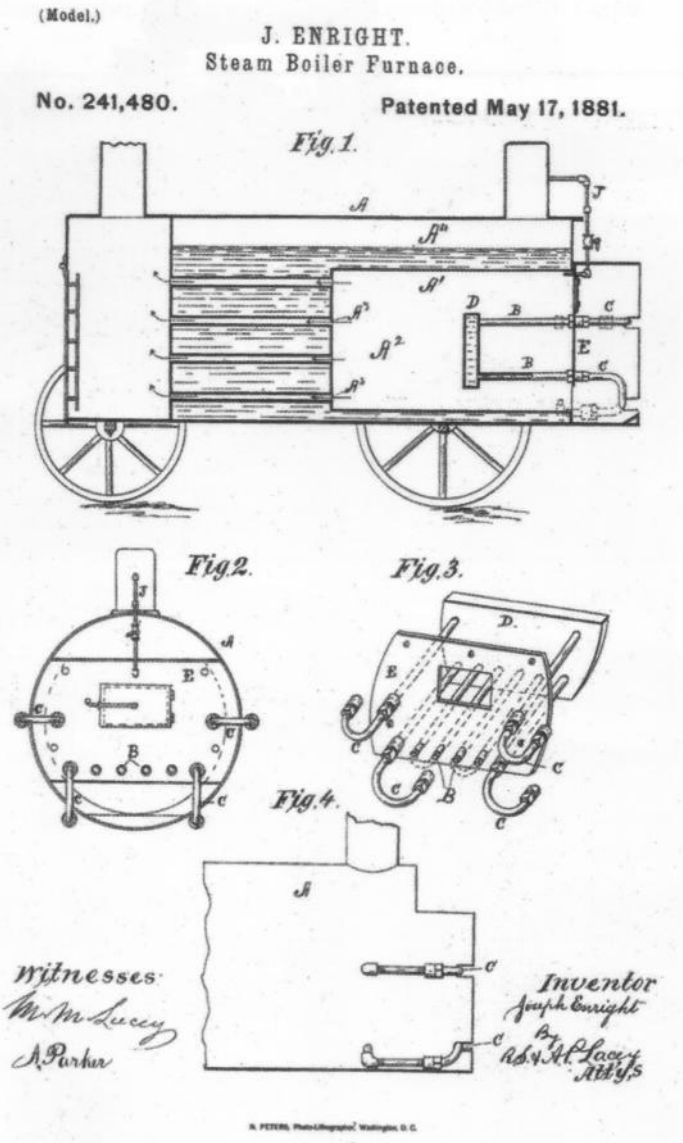
The *Tribune* also said, "Robert Baxter ... built a steam thresher engine at Stockton, going east to Massachusetts to have the first one built at the Ames Plow Co. Webster Bros., Stockton, farm implement house, introduced this engine to the farm public in 1869."

The *Tribune* continued, "Messrs. Ames, Byron Jackson, Harvey Rice, and Enright were all mentioned as present at one trial at Sacramento in 1876."

The *Tribune* added, "The Ames thresher engine appeared with the Laufenburg patent furnace boiler in the early '80s, Laufenburg being a Stockton inventor and builder of steam thresher engines and later of a few combined harvesters. John L. Heald, Crockett, brought out a straw burner that won first at the '84 State Fair. [Rice's] thresher engines were good enough to be handled by the great machinery distributor, Hawley, later acquired by John Deere Plow Co. of world fame. Rice and Enright dominated the California thresher engine field between them with lots of eastern U.S. competition from Ames of New York, Hoadley of Lawrence, Mass., Russell of Ohio and others battling it out with strong representation in California to show and sell their products in the toughest field of all."

The first page of *The California Agriculturist and Live Stock Journal* for May 1876 featured this lucid account of Enright's career to date: "Mr. Enright, of San Jose, ... has studied the wants of California farmers for many years, and has now succeeded in producing an engine that at once commends itself for practical use. The arrangement for burning straw is far superior to that of other engines, preventing any choking up of flues and at the same time, by admitting a larger supply of air, forming complete combustion. The economy of thus utilizing the straw that many farmers burn simply to get rid of it is apparent. For practical use, we believe this engine to be a worthy and successful invention. Following is a card from Mr. Enright in which he sets forth his claims: 'Fifteen years ago I constructed the first portable thresher engine on the Pacific coast, and its introduction in the harvest field was an important event in the history of grain raising in California. From that event up to this time, I have been constantly experimenting and improving on my original ideas of steam threshing in the open field, until I have now constructed an engine and boiler so near perfection that it is barely possible to be improved upon. Having for so many years made it a specialty to construct portable thresher engines, I can with confidence recommend my patent wood and straw burning engines manufactured by me at the present time. [Enright's patent model still exists and is in the Smithsonian collections.] They burn wood or straw without change, and coal by changing two plates; they have also the advantage of compactness, superior workmanship, great durability and economy in saving fuel, using but two tons of straw to equal one and a half cords of wood, and saving 40 per cent of fuel usually consumed by wood burners. It is a well-known fact that straw has been successfully used as a fuel to raise steam, in Europe, for many years, and it has been lately introduced on this coast, but with little success until I invented for that purpose my "patent ring grate and combustion chamber," which prevents any choking up of flues, and by which I am enabled to admit a larger supply of air, thereby forming complete combustion and doing away with all delays [in] the field. I built and sold thirteen of them last season, all of which gave entire satisfaction ... . I am now busy constructing twenty more for this season and intend to have them all ready for use this present harvest; I also intend to make it to the interest of all farmers to purchase of me, who need a cheap and economical power for threshing. I come before you with this power, with full

Continued on Page 34.



In 1881, Enright received yet another patent for a straw-burning boiler.

Continued from Page 29.

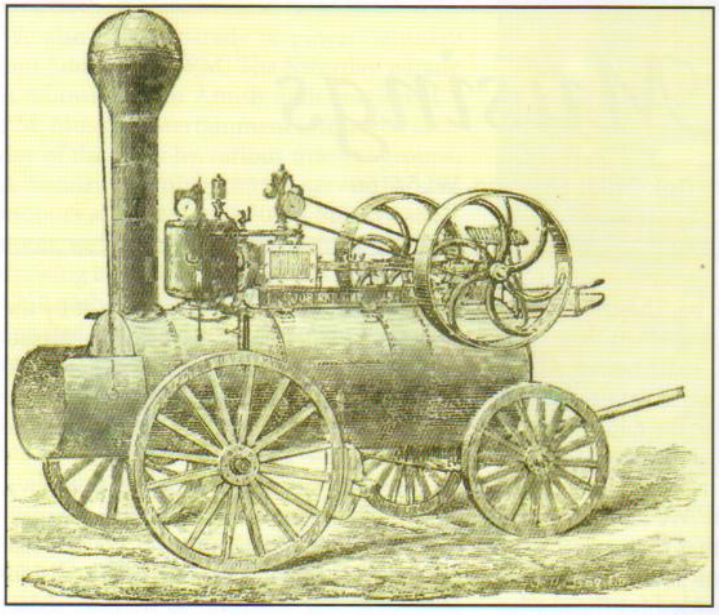
assurance of your patronage, having considered your needs in this very essential invention. I have had an offer from parties in San Francisco and Sacramento to have my engine built in the East on royalty, which offer I declined, although it may have been to my advantage to do so; I preferred to be sustained by the people of California in home manufacture, and I come before you with an engine that is guaranteed to you in every respect, and which took the premium at the California State Fair of 1875, as the best straw burner. And I further state that I hold myself in readiness to reinforce any of my customers; all that is necessary for them to do, is to send me a telegram and I will be at their service.'"

Would we not like to know which eastern firm might have extended an offer to build Enright's engines?

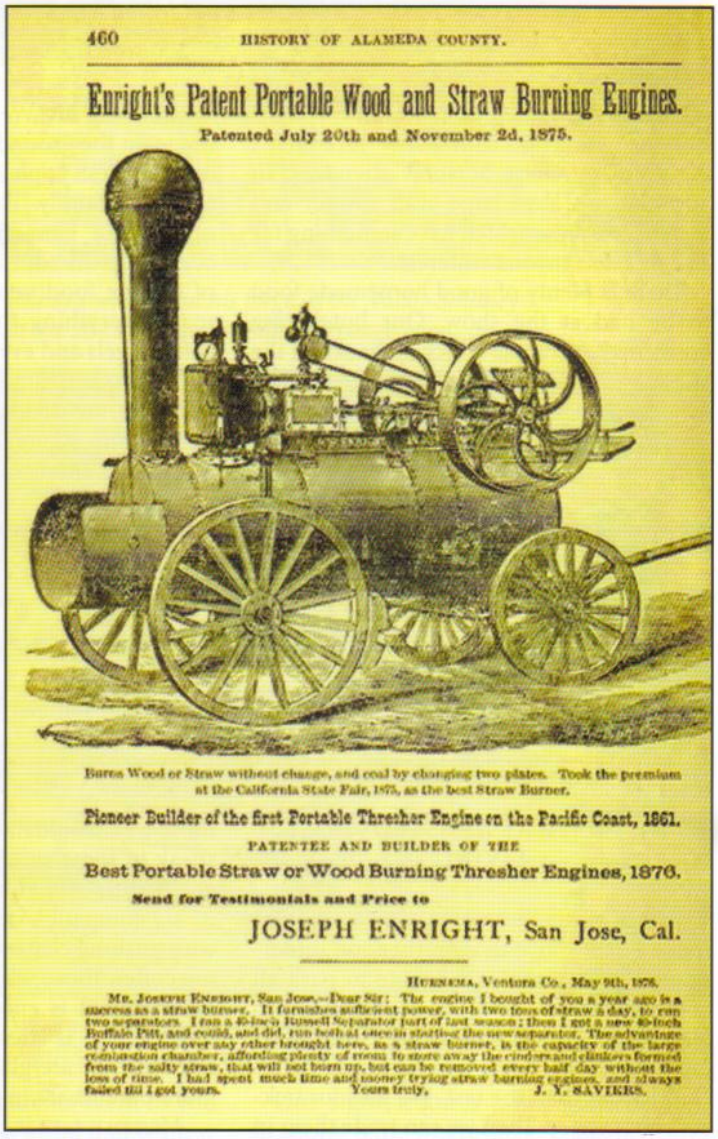
Page 517 of the *History of Santa Clara County, California* (San Francisco: Alley, Bowen & Co., 1881) gathered several significant details: "The principal manufacture … carried on [at Enright's factory] is that of the Patent Straw-Burning Portable Engine, recognized by all to be the most perfect of its kind in use. A sale is found for it all over the State; in 1879–80, sixteen different counties, from Tehama to Fresno, and from Monterey to Napa, were supplied with these, while over two hundred are now in use in various parts of California. The patent is Mr. Enright's own. Sixty men are employed on the premises … ." Clearly, Enright's firm was larger than Heald's.

One of Enright's shining moments occurred on the estate of Dr. Hugh James Glenn. Noted historian Dr. Reynold M. Wik memorably recounted the story on pages 30 and 31 in *The Iron-Men Album Magazine* for November and December of 1997: "Born in Virginia in 1824, Dr. Glenn … began buying land along the Sacramento River in California. He continued to expand his farm until by 1880 he owned 66,000 acres. In fact one of his fields was 17 miles long. Meanwhile, he invested $125,000 in farm machinery, $185,000 in horses and mules and $100,000 in buildings. His ranch included 32 houses and 27 barns, while his blacksmith shop had equipment enough to enable mechanics to build their own wagons, headers and various farm implements. One of his mechanics, George Hoag, constructed the mammoth separator … with a 48 inch cylinder and … driven by [an] Enright steam engine manufactured by Joseph Enright in San Jose, California. On August 8, 1874, this outfit consisting of 84 men and 130 horses and mules, threshed 5,779 bushels of wheat in one day—a remarkable feat in a day when threshermen in the Ohio Valley thought 900 bushels daily was an exceptional performance. On July 26, 1879, the Glenn ranch established a new world's record by threshing 6,183 bushels of wheat. This time George Hoag used a 25 horsepower Gaar–Scott steam engine and a separator of the same name."

Sadly, *The Pacific Rural Press* for the 9th of October in 1880 reported an accident at the Glenn ranch: "On Monday last, … the boiler of the engine 'Missouri Chief,' running the great separator 'Monitor,' on Dr. Glenn's place just above Princeton, exploded, killing three men outright and badly wounding several others. … The engine was built for Dr. Glenn by Jos. Enright of San Jose some three years ago and was the largest of the kind in use in the state. The separator was also very large. This was the machinery drawn by Andrew P. Hill in his celebrated oil painting of the harvest scene on Dr. Glenn's farm. The loss is not far from $5,000. … The boiler was what is known as the triple return pattern, and is not in favor with engineers. There is too much fire surface. … The flame[s] cannot be kept uniform, and hence most often have a too intense heat. This variation of heat will cause the water to rise and



This cut from the *California Agriculturist* in 1876 reveals the close similarity between the return-flue Rice portables and the Enright portables of the same period.



460 HISTORY OF ALAMEDA COUNTY.

Enright's Patent Portable Wood and Straw Burning Engines.

Patented July 20th and November 2d, 1875.

Burns Wood or Straw without change, and coal by changing two plates. Took the premium at the California State Fair, 1875, as the best Straw Burner.

Pioneer Builder of the first Portable Thresher Engine on the Pacific Coast, 1861.

PATENTEE AND BUILDER OF THE

Best Portable Straw or Wood Burning Thresher Engines, 1876.

Send for Testimonials and Price to

JOSEPH ENRIGHT, San Jose, Cal.

HUENEME, Ventura Co., May 9th, 1876.

MR. JOSEPH ENRIGHT, San Jose.—DEAR SIR: The engine I bought of you a year ago is a success as a straw burner. It furnishes sufficient power, with two tons of straw a day, to run two separators. I ran a 40-inch Russell Separator part of last season; then I got a new 40-inch Buffalo Pitt, and could, and did, run both at once in starting the new separator. The advantage of your engine over any other brought here, as a straw burner, is the capacity of the large combustion chamber, affording plenty of room to store away the cinders and clinkers formed from the salty straw, that will not burn up, but can be removed every half day without the loss of time. I had spent much time and money trying straw burning engines, and always failed till I got yours. Yours truly, J. Y. SAVIERS.

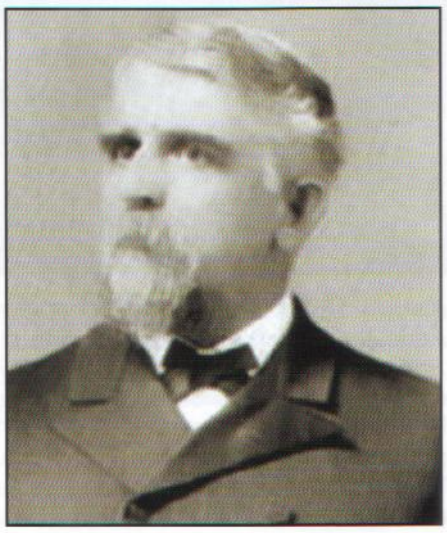
In 1876, *The Centennial Year Book of Alameda County* ran this page lauding the advantages of "Enright's Patent Portable Wood and Straw Burning Engines."

fall so that the engineer is sometimes at fault about the amount of water in the boiler. It is but right to Mr. Enright to say that his engines generally are not built after this pattern." *The Pacific Rural Press* lifted the description of the triple return boiler from the *Willows Daily Journal* for the 26th of July in 1879.

To illustrate an article, Dr. Wik published on the cover of *The Iron-Men Album Magazine* for November and December of 1997 F. Hal Higgins' copy of the Marcus C. Hawley & Co. ad featuring the painting by Andrew P. Hill that was mentioned in *The Pacific Rural Press*. Hill was both a painter

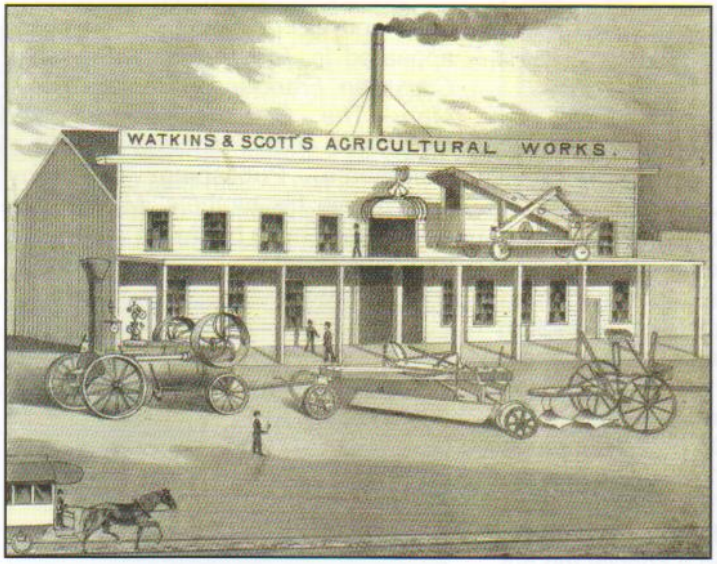
Dr. Reynold M. Wik contributed this cover illustration for the November–December 1997 issue of *The Iron-Men Album Magazine*. The vibrant ad presented Marcus C. Hawley & Co.'s agricultural products in eight vignettes surrounding a centerpiece painting by Andrew P. Hill, commissioned by Hawley in 1875 and mentioned in an article in *The Pacific Rural Press* in 1880. Hill's art features a large Enright engine. The portable in the upper left vignette is a J. C. Hoadley, and the portable beneath the Hawley name is a Rice. Although too small to be seen in this view, a Gaar, Scott & Co. engine stands in front of the warehouse in the vignette in the center at the bottom. Wik said the ad was in the collection of F. Hal Higgins. On pages 5 through 6 of *The Iron-Men Album Magazine* for January and February of 1952, Higgins said, "I got my second look at the Andrew Hill painting of the world's record threshing scene of 1875 when it was shown at the Glenn county fair at Orland, Calif., recently. I first saw it hanging on the wall of a ranch house one night on a special trip out … on the old George Hoag ranch. Hoag was [Dr. Hugh Glenn's] super-blacksmith who built all the wagons, headers, etc., when they couldn't buy such items big and rugged enough to suit their demands. … The engine in this famous painting was the 18 h.p. Enright that blew up three years afterwards … . Rice got the call to replace the Enright, his straw-burner patent having won the court battles against Heald at Vallejo, Brown Brothers at Salinas, Enright at San Jose, and Ames as sold with return-flue boilers by Baker and Hamilton after 1876 … . Mrs. Houghton, granddaughter of George Hoag, told me at her ranch that her grandfather brought Hill up from San Francisco for that harvest of 1875 to paint this scene. … [The] artist was there all summer and seemed to appreciate the ranch meals. 'He looked hungry,' reported Mrs. Hoag. When I saw the painting that night five years ago, it had a big hole torn in one corner from an accident to it in one of the hockings it got from a step-son to Hoag. Seems he needed a little cash now and then for liquid celebration and or poker sittings, and would sneak the painting out and hock it for a sum some enterprising local shop keeper knew Mrs. Hoag would readily redeem to replace the painting on the ranch walls. That went on for some years until the death of Mrs. Hoag. With the passing of the first and second generations of the Hoags, the painting was forgotten, neglected and left on the walls of the house till an Oregon cattleman bought land, building and contents."

This portrait of Marcus C. Hawley appeared in *The Builders of a Great City: San Francisco's Representative Men, The City, Its History and Commerce* (San Francisco Journal of Commerce Publishing Company, 1891). With his brothers, Marcus presided over a huge hardware warehouse and agricultural implement business.



George T. Hawley was one of Marcus C. Hawley's brothers and a co-founder of the Hawleys' vast hardware store enterprise. George served as treasurer of the firm. This portrait is from *The Valley Road*. Another brother named Walter N. was vice president. Born in Bridgeport, Marcus resided in Connecticut while conducting business in New York City. George and Walter lived in San Francisco.

This cut depicting the Hawley Brothers Hardware features a Gaar, Scott & Company portable engine in the foreground. Despite the presence of an engine built in Richmond, Indiana, the accompanying advertisement states, " ... the boast of the company is the Rice straw-burning engines for threshing, a California invention, which fully meets the requirements of California farmers. These engines are made expressly for the company." The cut was published in a book entitled *The Industries of San Francisco* (San Francisco: Payot, Upham & Co., 1884).



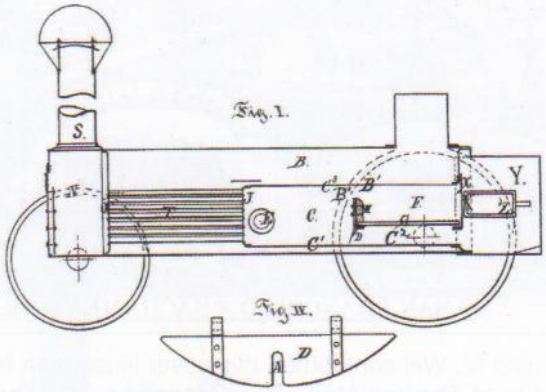
Also in 1876, this illustration depicting Watkins & Scott's Agricultural Works appeared in the *New Historical Atlas of Santa Clara County, California*. A few years later, a book entitled *History of Santa Clara County, California* (San Francisco: Alley, Bowen & Co., 1881) said, "The original promoters of [the Alameda Foundry] were Messrs. Scott & Watkins, who commenced the business in the year 1875, and retained it until 1877, when it passed into the hands of a joint-stock company, who transacted their affairs under the ... name of The San José Agricultural Works, but, at the end of a year, in 1878, the premises and good-will were purchased by F. Altman, the present proprietor. ... Employment is found for twelve men ... ." In directories, Watkins & Scott were described as "manufacturers [of] agricultural implements and steam engines." Could the square feeder for straw be an indication that the so-called Watkins & Scott engine in the engraving is a Rice equipped with the square feeder by David Morey before the oval feeders replaced it?

and photographer. Today, Hill is best known for initiating and leading the effort to save and protect forests of giant sequoia (redwood) trees.

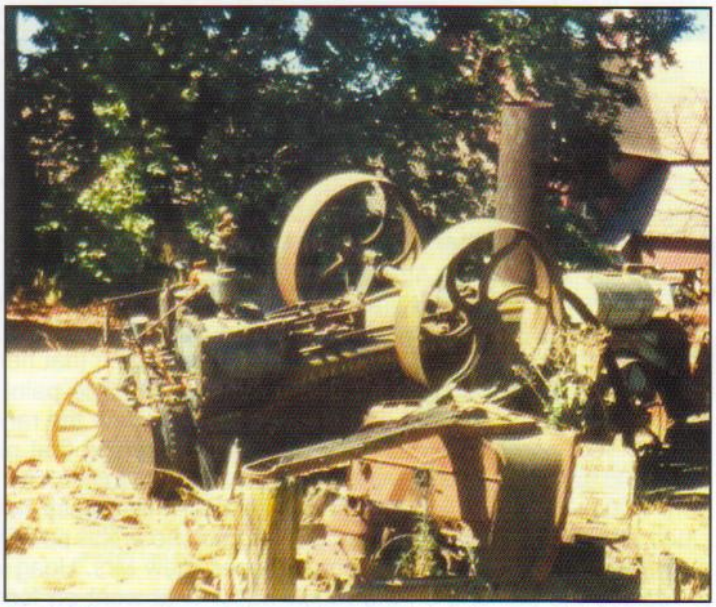
Now we can answer why various center-crank agricultural engines in California in the late 1800s resemble one another so closely. Once Hoadley and Ames had established a predilection for center-crank design that was widely imitated—and once Ames had produced essentially a facsimile of the Rice engine—it remained for Heald and Enright to collaborate in their imitation of Rice while narrowly evading infringement. Those of us who enjoy identifying the manufacturers of farm engines in historical photographs must be on our toes whenever we encounter an image of a center-crank engine in California, for an engine of one builder can pass for that of another.

J. ENRIGHT & J. L. HEALD.
Steam-Boiler Furnace.

No. 203,253. Patented May 7, 1878.

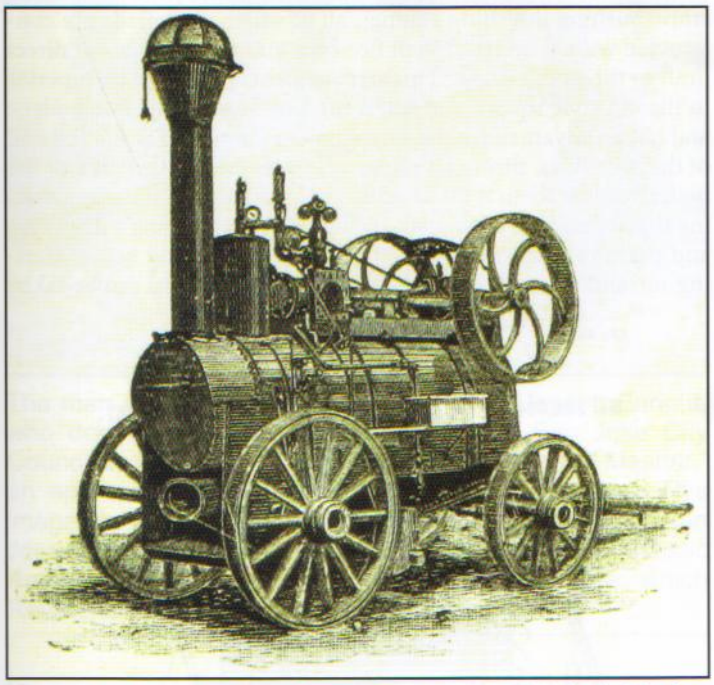


In an action more transparent than many agreements between companies in the steam era, competitors Heald and Enright combined forces to patent a boiler dodging Rice's complaints about infringement; having patented the boiler together, Enright and Heald must have used the same boiler for a time.



Jack Alexander, author of several books on old iron, rescued this Heald portable engine and restored it. Courtesy Jack Alexander

In November of 2011, *Farm Collector* published this photograph of an early 1880s Heald. (See http://www.farmcollector.com/steam-engines/straw-burning-portable-steam-engines.aspx.)



In 1884 in issues of *The Pacific Rural Press*, Mitchell, Fischer & Ketscher of Oakland advertised this engine resembling Rice and Enright portables. Joseph Ramsden Mitchell, Frank Xaver Fischer & Gustave Ketscher's ad read "We make three sizes of Boilers to order, with Engines to suit, having 160, 200 and 290 square feet of heating surface. As it is the effective Heating Surface of the Boiler, and not the size of the Engine Cylinder alone which gives the Power, we have given the Heating Surface of the Boilers rather than the Diameter of Cylinder and Stroke of the Engine. The Boiler, however, having 290 square feet of heating surface is used with our largest size 9 x 12 Engines, which will run the heaviest threshing rigs in the field with ample power. We make our Engines and Boilers of the best material and workmanship throughout, and think we can safely guarantee them to give entire satisfaction to all who may use them. We are not putting an untried machine in the field, as our Engines have been in use for the past four years ..." On the 27th of December in 1888, the *Oakland Daily Evening Tribune* reported Mitchell never could agree with the other partners, the partnership would be dissolved, and a receiver would be appointed; on the 18th of January in 1890, the *Oakland Tribune* carried a notice suggesting that the firm of Mitchell, Fischer & Ketscher was still doing business.

Contact steam historian Robert T. Rhode at 990 W. Lower Springboro Rd., Springboro, OH 45066; e-mail: case65@earthlink.net

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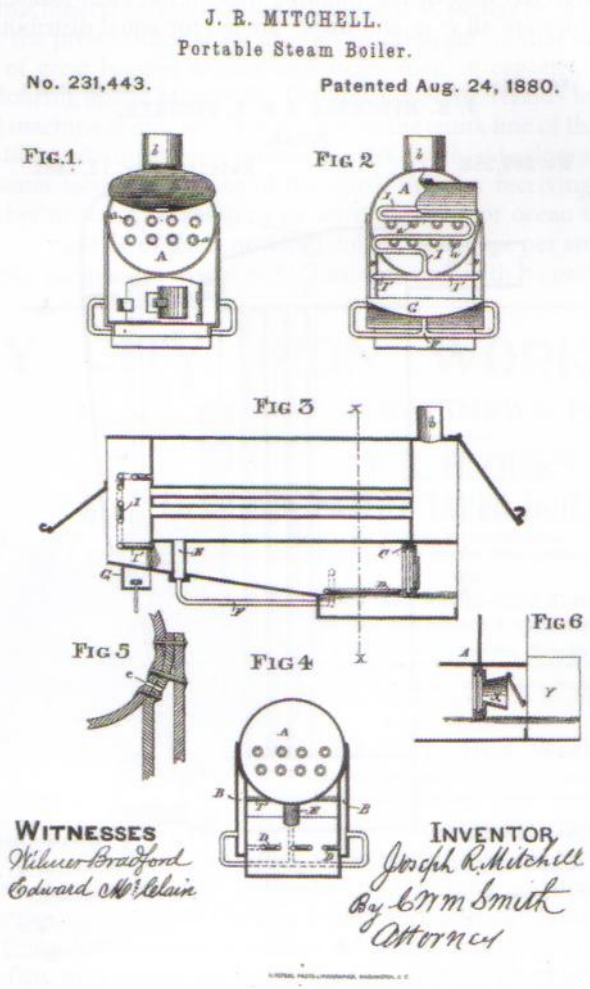
Description of Heald's Foundry and Crockett on pages 415–18 in *History of Contra Costa County, California* (San Francisco: W. A. Slocum & Co., 1882)

CROCKETT.—The town of Crockett, upon the Straits of Carquinez, about six miles below Martinez, and named in honor of ex-Judge J. B. Crockett, late of the California Supreme Bench, has a pleasant beach location with a fine outlook over the San Pablo Bay to the Coast Range from Mount Tamalpais to those of Mendocino in one direction, and to the Sierra Nevada in another. The town site is laid out from the Edwards Ranch, and is to have an ample supply of good spring water, distributed through iron pipes. The location of Heald's extensive machine shop and foundry at that point created the necessity for, and insures the considerable future growth of the town, in which the sale of intoxicating liquors is forever prohibited by provisions in all deeds for sale and conveyance of lots. Besides the large three-story hotel completed and opened recently by Mr. Pinkerton, several well-planned cottage dwellings are being erected by employés of Heald's works, and others will likely be commenced at no very distant date. A roomy building, erected and used for boarding the men employed in building the machine shop and foundry, has been utilized for a school-house, furnished with

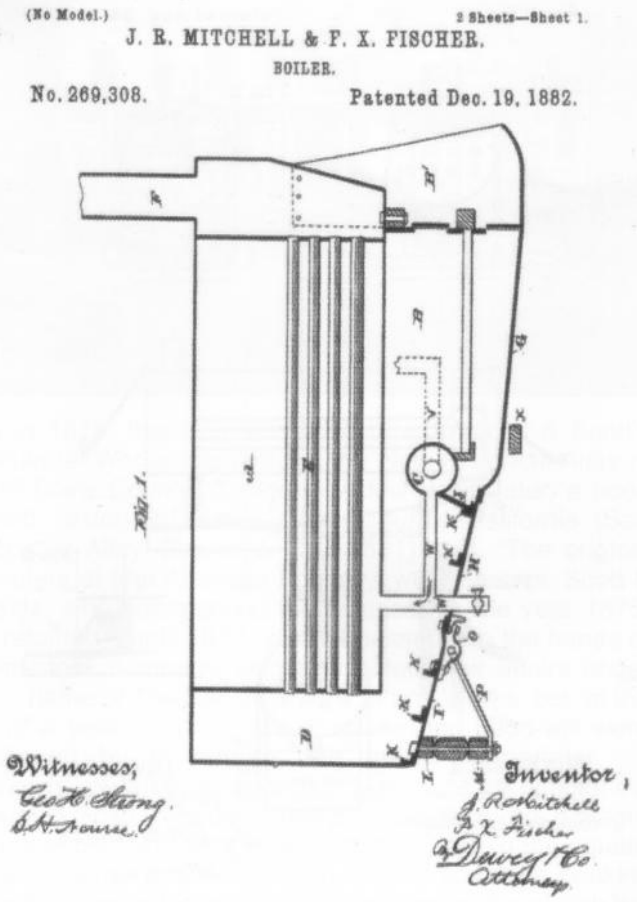


Joseph R. Mitchell patented a boiler in 1880.

handsome seats and desks, blackboard and interior walls whitened, making a school-room amply spacious and of pleasant aspect, which has been placed under the superintendence of Miss Lottie Bent, of Martinez, a graduate of the State Normal School.

As now laid out, the town tract of Crockett consists of eighteen blocks, divided into lots of fifty by one hundred feet each, the streets running east and west. The first thoroughfare to the north is named Loring Avenue, next is Winslow, Alhambra and Edwards streets; the others are called Bay, Heald, Jackson and Vallejo. Within the town limits there are thirty-one acres, and all most desirable as a place of residence and a center of trade. The town site was surveyed by T. A. McMahon, County Surveyor.

HEALD'S FOUNDRY.—The most important and extensive industrial enterprise of permanent character ever undertaken in Contra Costa County is that of J. L. Heald, at Crockett, on the railroad and deep water frontage of the Straits, six or seven miles below Martinez. Mr. Heald had developed his business to large proportions at Vallejo, where he found himself under disadvantages for its enlargement and prosecution, and, in looking up a new location with superior advantages, determined upon the one he has chosen as better suited to his requirements than any other to be obtained. With the Messrs. Edwards, father and brothers, he made satisfactory arrangements for shop site and wharf franchise, and joint interest with them in the lots of the adjacent tract laid out as a town site. The town and his works are supplied with water from springs on the Edwards farm, through iron main and distributing pipes furnished and laid by Mr. Heald. The foundry and machine shop building is of brick, laid in cement mortar, three hundred feet long by one hundred wide, inside clear measure; the openings are all over and under arched for equal distribution of roof and wall weight upon the foundations. The roof covering is heavy corrugated sheet iron, supported upon iron truss girders and rafters, making a completely fire-proof structure, and one of the largest and most substantial in the State, for the purposes designed. While the establishment is provided with first-class appliances for the manufacture of almost any description of boilers, machinery, and stationary and movable steam engines, it is more particularly intended for the manufacture of threshing steam engines, separators, grape-crushing, stemming and pressing machinery, barley mills, and other agricultural machinery, of the styles Mr. Heald has originated or greatly improved, and which have won high favor upon their tested merits. In the absence of Mr. Heald, on our visit to the works, we are under obligations to Mr. Etchells, the Superintendent, and to Mr. Charles, of the separator construction department, for information given us concerning the various classes of machinery manufactured at the establishment. Among the leading specialities of the manufactory are Mr. Heald's straw-burning threshing engines, all of which now made are constructed with cylindrical shell fire-box, and tubular flues of direct draft to the smoke-stack. This arrangement is found to be superior to the old style square, restricted fire-box, and return flue boilers; and has an advantage in the arrangement for getting at the fire end of the tube flues, through tubular apertures from either side of the boiler, to clear them if they become obstructed, and thereby avoiding the necessity of raking out the fire-box at all during a day's run, and permitting it to be cleaned only in the morning before starting-up, and when the ashes and cinders are cold and can be taken


(No Model.) 2 Sheets—Sheet 1.

J. R. MITCHELL & F. X. FISCHER.

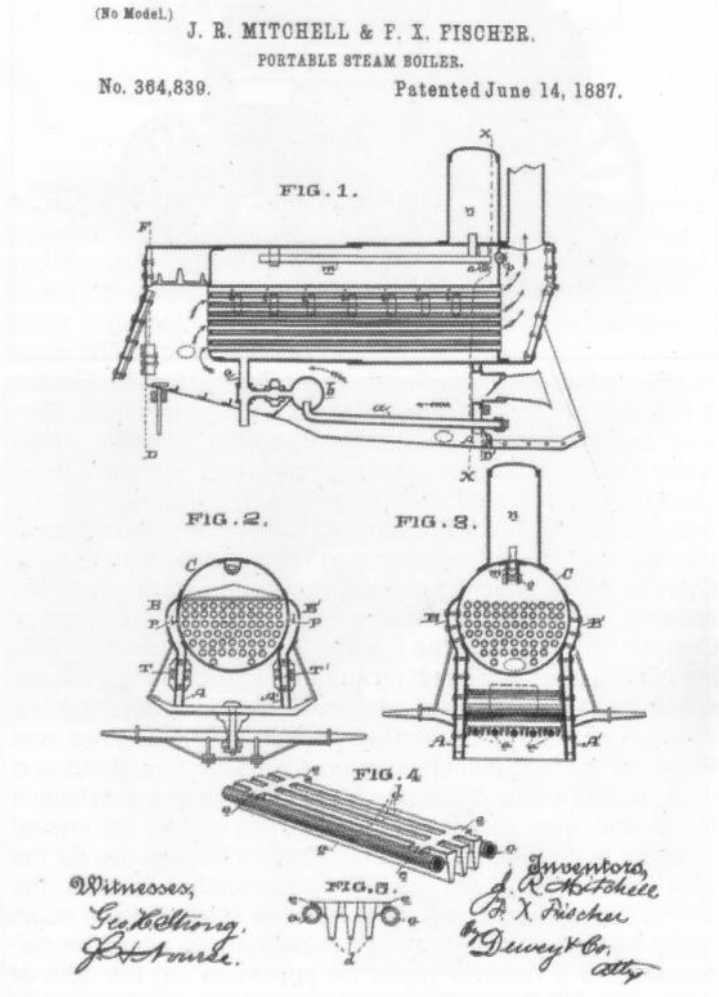
BOILER.

No. 269,308. Patented Dec. 19, 1882.

Witnesses; Geo. H. Strong. S. H. Krause.

Inventor, J. R. Mitchell, F. X. Fischer, by Dewey & Co. Attorneys.

Joseph R. Mitchell and Frank X. Fischer patented a boiler in 1882.


(No Model.)

J. R. MITCHELL & F. X. FISCHER.

PORTABLE STEAM BOILER.

No. 364,839. Patented June 14, 1887.

FIG. 1.

FIG. 2.

FIG. 3.

FIG. 4.

FIG. 5.

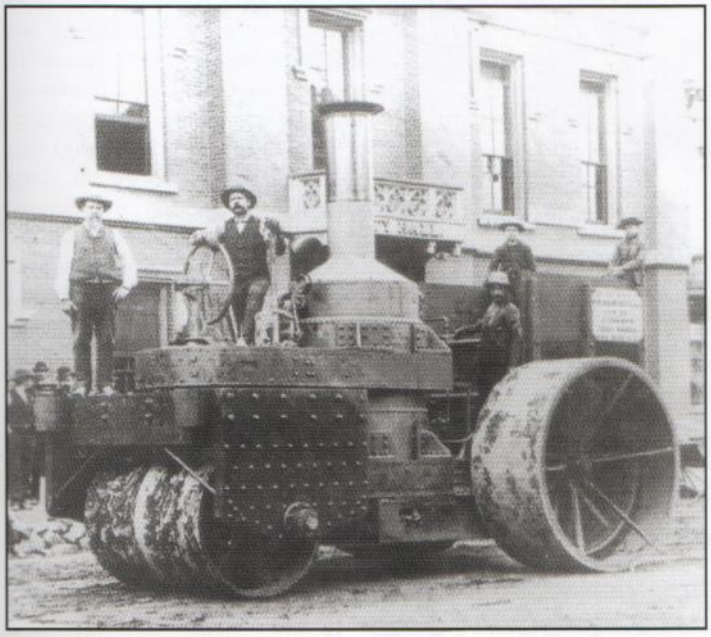
Witnesses; Geo. H. Strong. S. H. Krause.

Inventors, J. R. Mitchell, F. X. Fischer, by Dewey & Co. atty.

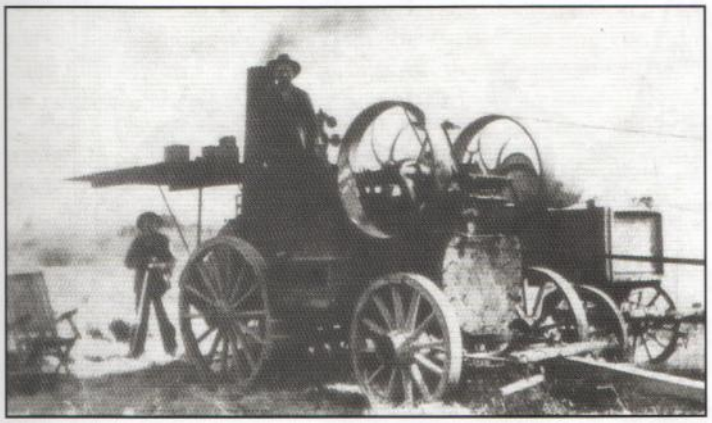
Joseph R. Mitchell and Frank X. Fischer patented a portable boiler in 1887.

out without danger of fire. The threshing engines are made of three sizes, respectively of twenty, thirty-five and fifty-horse power—and one of the largest size is now at the shop receiving its finish for shipment to Dr. Glenn, at Colusa. The threshing engine boilers are all covered with thick non-conducting felting, on which is first a wood slat, and, outside of that, a galvanized iron sheathing. The engine crank shafts are all bent to form in the solid bar, while hot, by hydraulic pressure, and are in no danger of breakage from cold shuts, strain cracks, or imperfect welds. Mr. Heald's separators are built of various sizes, from thirty-six to forty-eight-inch cylinders, and, besides having been brought under test of practical field operation, to the highest degree of threshing, separating and saving perfection, he combines with them in the same frame, a re-cleaning apparatus, that turns the wheat out as thoroughly cleaned as it is in going through the process in a special cleaning machine.

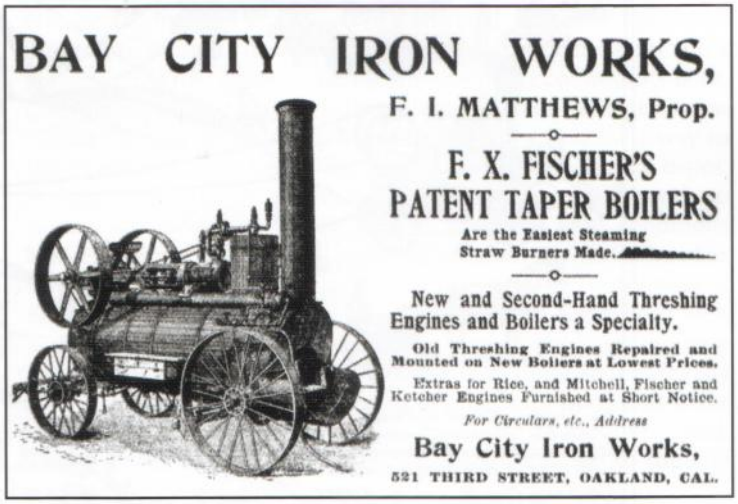
Grape crushing, stemming, elevating and pressing machinery, and handling appliances, with specially adapted stationary steam engines of several sizes, for operating the machinery, are among the specialities of this establishment; and those of the grape raisers who require any or all of the appliances for their work in wine making, will do well to inspect Mr. Heald's grape-working mechanism. Heald's Roller Crushing Barley Mill has been amply tested, and does it work, as is claimed, better and more economically than any burr mill. It is simple and consists of two strong, plain cylinder rollers, eighteen inches in diameter by eighteen inches width of face, both driven by a belt upon the shaft pulley of one of them, the grain feeding down from the hopper between the two rollers. Running with a twenty-horse steam power threshing engine, this mill is said to have the capacity of sixty tons per day. Hydraulic presses of various sizes, for grape pressing or other purposes, are also among the specialities of the establishment. Besides the threshing, and the compact and handsome style of the stationary steam engines for grape crushing and pressing, almost every other description of stationary and portable steam engines, boilers and other machinery, are made at the establishment, as may be ordered; and at the present time there are two magnificent tubular boilers there, of great heating surface and steam-making capacity, for a large flouring mill at Marysville. The location of Mr. Heald's foundry and machine shops, with a side track of the trunk line of the two inter-state and continental railroads at its south-side doors, and deep water facilities at those of the north side, for receiving coal and other material, or shipping its wares for river or ocean transportation, must be of many hundred dollars advantage per annum, with only the present extent of his business; and with its probable



The man standing at the left is most likely Joseph Enright, who demonstrated this steamroller to the San Jose City Council in 1885. Enright named his roller "Billy the Masher," an appropriate sobriquet for such a hefty machine. This image, in the collection of the Sourisseau Academy, San Jose State University, appeared on page 56 in *Classic American Steamrollers, 1871–1935 Photo Archive*, which Raymond L. Drake and I wrote.



Page 18 of *The Iron-Men Album Magazine* for November and December of 1956 included this photograph with this caption: "An Enright steam engine used by W. S. Burr in the San Joaquin Valley of California, 1903. It is threshing alfalfa seed. The Enright was one of the famous California steam threshing engines from 1871 to gasoline days, being rivaled only by the Rice built in San Francisco, the two standing off the Mid-west, East and British steam straw-burners in the red hot competition for the threshing business. Photo from Lloyd Burr, of Redding, California, whose grandfather operated this engine"



In 1898, 1899, and 1900, the Bay City Iron Works, founded in 1885 in Oakland, advertised this return-flue engine with an obvious connection to the Mitchell, Fischer & Ketscher machine through the Fischer boiler and with similarities to the Enright machines of earlier decades. Interestingly, the Bay City Iron Works ad says, "Extras for Rice, and Mitchell, Fischer and Ketcher [sic] Engines Furnished at Short Notice."

ENRIGHT'S PATENT STRAW-BURNING PORTABLE THRESHING ENGINE

—FOR 1885—

IS THE MOST SUCCESSFUL, ECONOMICAL, COMPACT, AND RELIABLE FORTABLE STRAW-BURNING ENGINE ON THIS COAST.

The following are a few of the TESTIMOMIALS Recently Received from Purchasers of my Engine:

Arlington Farm, Davisville, Mar. 24, 1884.

Joseph Enright—Dear Sir: Your letter, written so long ago, had been misplaced and only en yesterday was brought to my notice. I hope I will not be too late for the purpose for which you desired my statement. I can only say that your new style Enright water grates and fire wall, as placed in my engine last season, gave me complete satisfaction. I found them to be of immense advantage in the rapid generation of steam. They are wonderful improvements over the old style of grate bars, as they never heat through, nor are "clinkers" formed upon them. I cheerfully recommend them to all threshing men. Yours truly, H. M. LARUE,
Farmer, Sacramento, Speaker of the Assembly and ex-President of the State Agricultural Society.

Mountain View, Mar. 25, 1884.

Joseph Enright—Dear Sir: The engine which we bought of you gave the best of satisfaction and cannot be beat. I have been in the threshing business for many years, and also handling engines, but yours beats any that I have ever handled. I recommend it to be the best in the world, exempting none. Yours truly, THORNBERGER & DONAHUE.

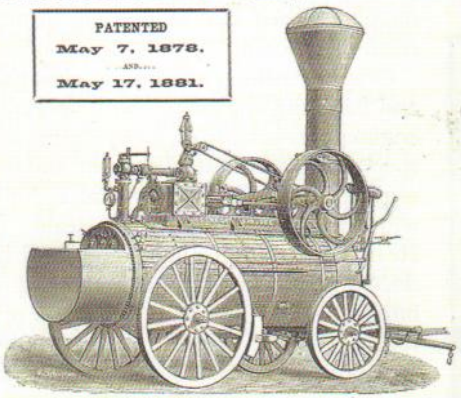
Binghamton, Mar. 6, 1884.

Joseph Enright—Dear Sir: Yours of Feb. 28th is received, asking how I liked the engine you sold me last year, and in reply I would say that your engine gave perfect satisfaction in every respect. It did all that you claimed for it. I do not want any better engine. H. H. McKINSTRY.

Roseville, July 17, 1883.

Joseph Enright—Dear Sir: I take pleasure in stating that the engine I bought from you this season is all that I was recommended to be, and am well pleased with the way it moves everything that I attach to it. It moves off very smooth and easy in every way, and hauls one horse easier than the one I had last year, on account of its wide tire in soft ground. I am also much pleased with your patent oil cups, as they do not require so much attention in oiling, and, in fact, I think it is the most complete field engine that I ever saw at work. Respectfully yours, GOULD BROS.

PATENTED
May 7, 1878.
AND
May 17, 1881.



Binghamton, March 6, 1884.

Joseph Enright—Dear Sir: In regard to your inquiry, the engine we bought of you last season, works to perfection. We had no trouble in keeping up steam; it gave all the power we needed to run a 40-inch separator and grain cleaner and derrick fork hoist. I can with confidence recommend it to any one who intends buying an engine. Yours truly, F. R. DODGE & SON.

St. Johns, Colusa Co., Cal., Mar. 9, 1884.

Joseph Enright—Dear Sir: In answer to your request asking how I liked your engine I bought last year, I would say that I liked it well, and am well pleased with it. I took it out in the field just as it came from your shop, and commenced threshing with a 40-inch Pitt's separator, and ran 80 days, and never lost five minutes during the whole run, whether for repairs or steam. I believe it would pull another thresher, it runs so light and easy. One hundred pounds is the most I ever used, and that only in the morning, while it is damp. Ninety pounds is enough in any ordinary day threshing. It is no trouble to fire; a boy can fire it, it steams so easy. I can start a fire in the morning and be threshing in twenty-five minutes with ease, and not only that, but everything seems to be in proportion and well put together, and runs like a new buggy wheel. I will venture to say that the expense of repairing my engine this spring will not exceed $20, and I would suggest to all threshing men in need of an engine, to buy one of your 9x30, the same as I have, for I feel confident that they are going to be the leading engines in the harvest fields of California. Yours respectfully,
JAMES Q. DEVENEY.

Davisville, Mar. 15, 1884.

Joseph Enright—Dear Sir: I feel under many obligations to you for the engine you sent me last June. It filled the bill, and I found it better than you even told me it was. I found no straw that I could not make all the steam with I needed to run a 40-inch Bronson Pitt's thresher and Nash & Cutt's cleaner; attached, also, Jackson's feeder with long elevator. Your water grates I think a success and a help in raising steam. Yours respectfully, R. J. GUTHRIE.

Hanford, Tulare Co., July 18, 1882.

Joseph Enright—Dear Sir: I take pleasure in certifying that I used, the past season, a 20-horse power steam threshing engine, of Mr. Joseph Enright's patent, and that the same is very easy on fire, and gives me ample power to run a 40-inch separator.—That I ran the engine 102 days, now from the shop, without having to expend one cent for repairs, and I hereby assert that I do not think there can be any better engine made for threshing purposes.
NELSON ARCHIBALD.

Salinas City, Monterey Co., Feb. 1, 1882.

Joseph Enright—Dear Sir: The engine I purchased from you in 1881 gave me very great satisfaction. I never had any trouble with it whatever, and it fired easier than any engine I ever saw, boulder having any amount of power Yours, very respectfully, MICHAEL LYNN.

WITH

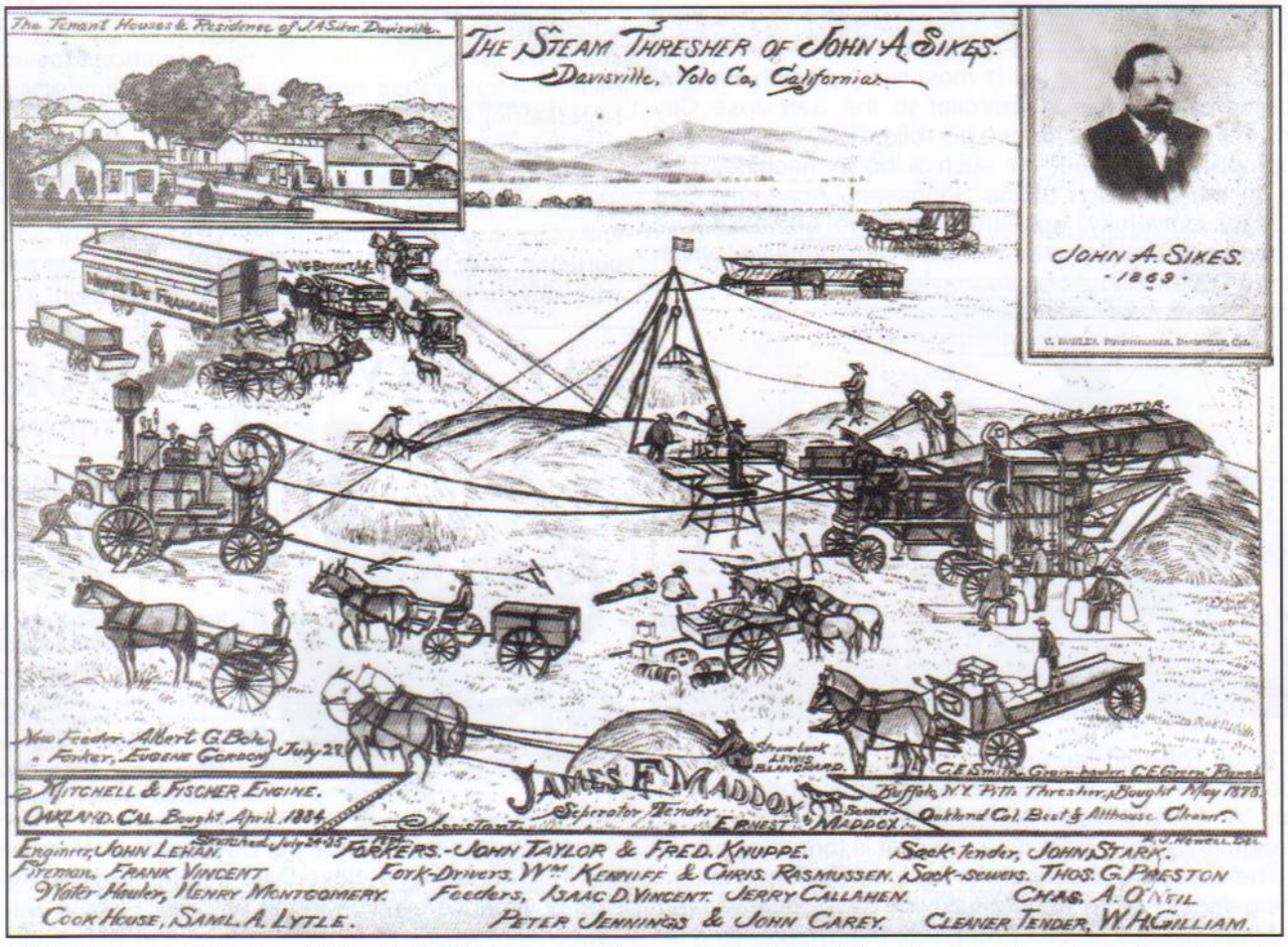
Patent Water Bridge Wall and Water Grates.

TOOK PREMIUM AT STATE FAIR, 1882 and 1883.

Address all Communications to JOSEPH ENRIGHT, San Jose, California.

In 1885, Enright ran this lavish advertisement.

expansion, in course of a few years the saving thus effected in drayage, tolls, and other incidental expenses, will reach the amount of thousands per annum. With the high reputation of his machinery, for its special purposes, his advantageous location, the already well-established qualities and large demand for his machinery, there is every reason to anticipate that Mr. Heald's business will soon expand to as large proportions as any in its line upon this coast. The advantages of the deep water frontage along the Straits, from Bull's Head to Vallejo Junction, with the railroad alongside all the way for large manufacturing industries, and especially for flouring mills, are so great and apparent that they cannot long remain unimproved, and we may look in a few years to see many of the available sites occupied for such purposes.



This lively sketch of a Mitchell & Fischer provides many insights into nineteenth-century threshing in California. The illustration states that the engine was purchased in April of 1884 and that the Pitts thresher was acquired in 1878. The derrick threshing took place on the farm of John A. Sikes near Davisville (later shortened to Davis) in Yolo County.