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# Engineers & Engines

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**THE BI-MONTHLY MAGAZINE FOR ALL STEAM, GAS, TRACTOR,  
RAILROAD, LOCOMOTIVE AND FARM MACHINERY ENTHUSIASTS**



# Obed Hussey

## And His Ohio Test of the First Successful Reaper

By Robert T. Rhode and Leland Hite



The young Obed Hussey, inventor of America's first successful reaper, peers from this tintype in the collection of Martha Hussey and presented online in the Digital Gallery of the New York Public Library.

It was the middle of June in 1835. The farmers and mechanics that had gathered at Jedediah (often given as Jediah) Hill's farm north of Mt. Healthy, Ohio, were in high spirits. Inventor Obed Hussey, blacksmith and farmer John Lane, farmer and mill owner Hill, Hill's son-in-law Henry Rogers, farmer Algernon Sydney Foster, younger brother Thomas Jefferson Foster, and others hitched the newly minted reaping machine to a team of horses. Surrounded by ruddy-cheeked men and cheerful boys, including Lane's sons, the reaper entered the barley field. Soon, the invention with its iron teeth was mowing the crop and leaving stubble in its wake. Hussey urged the draft horses to a pace faster than that to which they had become accustomed. Wide-eyed and snorting their surprise, they clipped off a rapid stride. The men nodded to one another as the snappier speed cut the stalks perfectly.

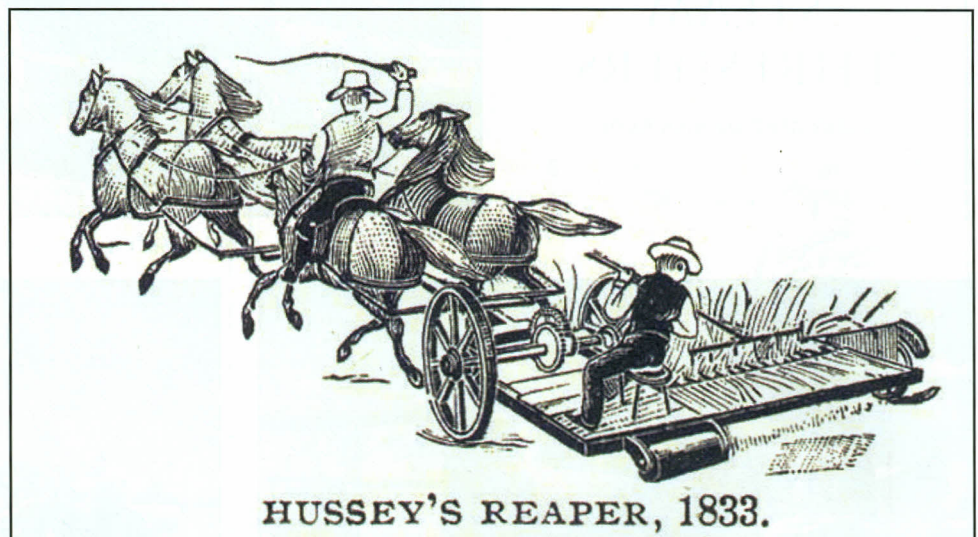
Were these men aware that they had just made world agricultural history? ... that their names would be recorded forever? ... that the destiny of Earth's civilizations was in their hands? Probably not. We recently walked across a covered bridge

and stood at the edge of the former barley field. Ironically, the farm that had been cleared of trees by arduous labor when the United States Constitution was drafted has become a forest again. Not far from the famous barley field, ranch houses with clipped green lawns border the tangled thickets draped with wild grapevines and Virginia creeper. The homes face across the road to the site where Hill's mill stood and where Rogers, with consummate skill, finished the reaper under Hussey's supervision. Despite the presence of tall trees and undergrowth, we could picture the momentous day 179 years ago. With sunlight and shadows of clouds dappling the stones of Mill Creek and robins singing their morning songs, we silently contemplated the fact that our feet were planted where the feet of some of the greatest inventors of the Industrial Era had walked.

For it was in that barley field that the first successful reaper, a machine that would initiate an agricultural revolution, was tested!

The earliest years of Hussey's life are obscured by the passing of time, and tal-

ented genealogists have reservations about the Hussey lines, which have spawned stunning contradictions; for example, as genealogist Ann Miller Carr told us, some researchers say that Obed's ancestor Christopher Hussey died in Hampton, New Hampshire, while others allege that Christopher, a sea captain, was devoured by cannibals on the coast of Florida. Confusion about Obed's early years probably results from the fact that several generations of Husseys had men named Obed, and several of them overlapped. The Obed Hussey of our story was the son of Samuel and Charlotte and was born on the 7th of October in 1790 in Hallowell, Maine. In a letter to his friend Edward Stabler (dated March 12, 1854), our Obed Hussey wrote, "I never experienced half the fatigue in rowing after a whale in the Pacific Ocean (which I have often done) as I experienced year after year for eighteen years in the harvest field ..." (quoted in Greeno). Some writers have opined that the inventor lost an eye and an arm in an accident while on a whaling ship. That he wore a patch over one eye is not contested,



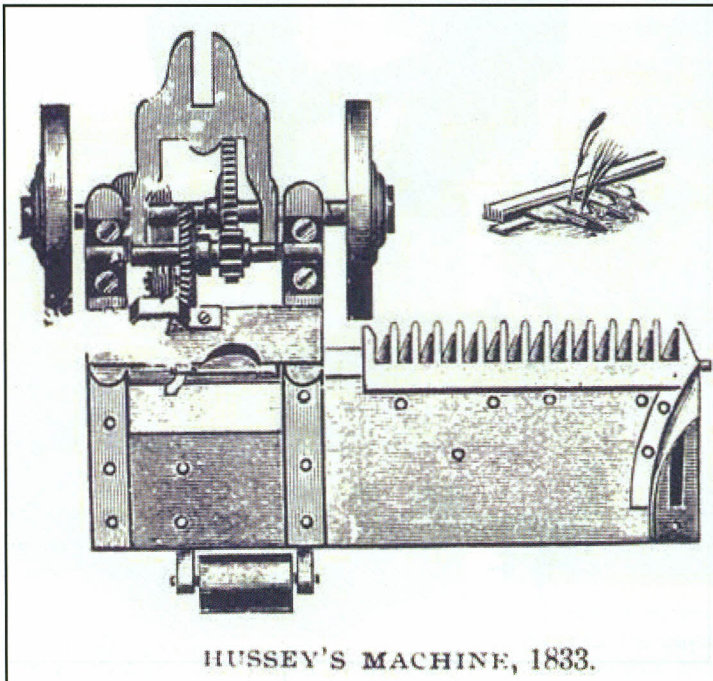
Two years before Hussey tested his newest reaper in a barley field near Mt. Healthy, Hussey put prototypes through their paces on Algernon Foster's farm 3½ miles east of the Lane blacksmith shop. This sketch affords a rare glimpse of one of Hussey's early machines tested in 1833. Note that the operator sits on a stool! Four horses are needed to pull the machine, and they are being whipped into a fast pace. The illustration appeared in Robert L. Ardrey's *American Agricultural Implements: A Review of Invention and Development in the Agricultural Implement Industry of the United States* (Chicago, 1894), which is online. The same art (redrawn) was featured on page 786 in Volume 6 of the *Agricultural Gazette of New South Wales* in 1895.



as photographs depict the patch, but there is no evidence that he lost an arm. If he is the person depicted in an ad for one of his early reaping machines, he has both arms and is using them. A widely distributed photograph of Obed Hussey from around 1850 includes two arms; whether both were functional cannot be determined. Ann Miller Carr *has* traced a distant relationship between



Currently the front yard for a residential structure, this land in 1835 was a barley field used as the test site for Hussey's reaper. The field was located north of Mt. Healthy, Ohio. Industrialist Clark Lane, 12 years old at the time, later remembered that the reaper performed well "in presence of many hilarious, expectant and over-pleased neighbors" whom Lane identified as "many farmers, mechanics and others." Clark's father, John Lane, made the parts for the reaper in his smithy.



Ardrey offered this nicely shaded drawing of one of Hussey's prototype reapers from 1833.

Obed Hussey, who was the inventor of the first successful reaper, and William Hussey, who was the plow manufacturer of North Berwick, Maine. William's nineteenth-century business has morphed into today's Hussey Seating Company. (See [husseyseating.com](http://husseyseating.com).) Perhaps inventiveness characterized various Hussey family lines.

We must quote several paragraphs from H. E. Jacob's influential book (translated by Richard and Clara Winston) entitled *Six Thousand Years of Bread: Its Holy and Unholy History* (New York: Doubleday, 1945). You are about to read at least two assumptions masquerading as facts. We will challenge them. These assumptions have been widely quoted, reprinted, and paraphrased, but such repetition does not transform them into truth. Between the lines (below) are the paragraphs, taken from pages 273 to 275 of Jacob's account:

The reaper, too, was not uniquely invented by Cyrus McCormick. It was invented at the same time by a Yankee named Obed Hussey, who afterward amiably commented that it was astonishing "that it hasn't been made before." The colorful

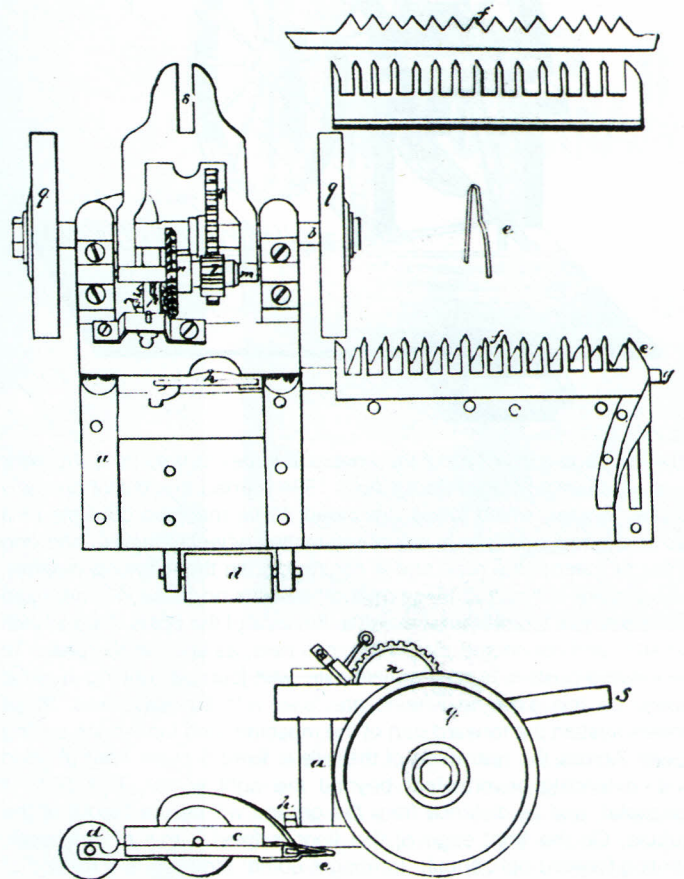


Diagram Showing Arrangement of Guards and Knives

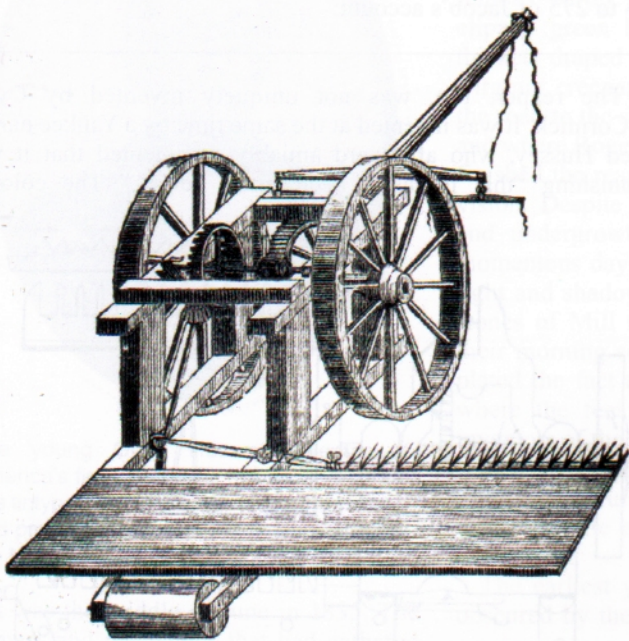
In 1912, Follett L. Greeno, whose uncle married Hussey's widow, published a widely circulated privately printed book entitled *Obed Hussey: Who, of All Inventors, Made Bread Cheap* that defended Hussey as deserving of the honor of having invented the first successful reaper. Greeno's book is available online. It features several fine illustrations. Here we see essentially the same diagram of Hussey's reaper that was printed in a shaded view in Ardrey's *American Agricultural Implements*. This drawing near page 122 in Greeno's book includes a side elevation. For longer than two decades, Hussey kept improving his reaper designs.



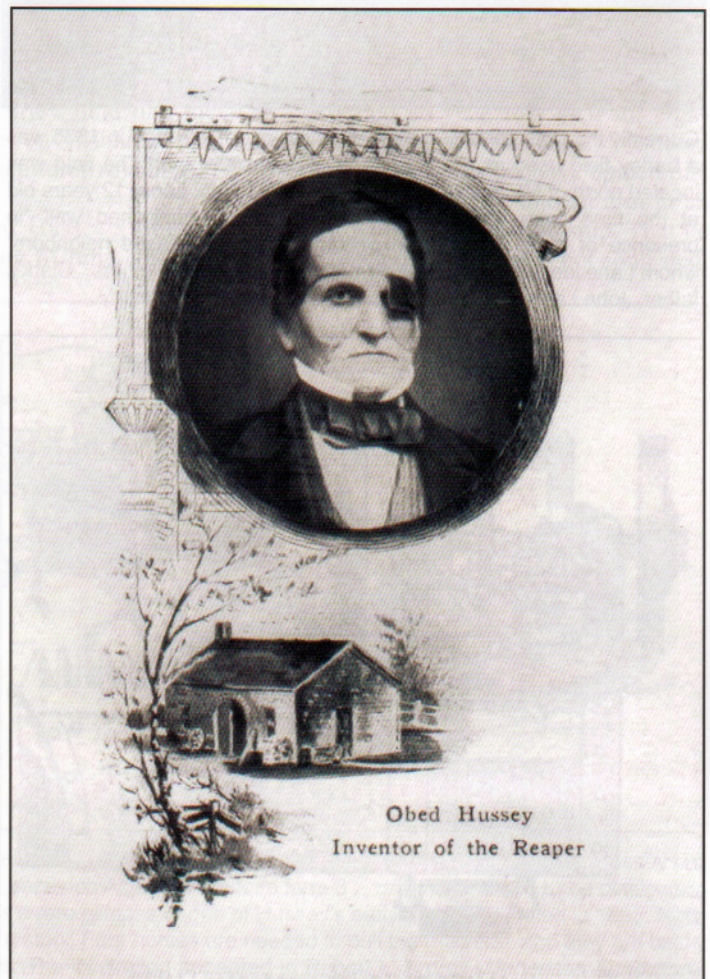
Hussey, an amateur mechanic whose hands possessed extraordinary skill, had been a sailor. His relations with farming were of the vaguest. In fact, he was drawing up plans for a candlepouring machine when a friend's conversation started him on the reaper. The reaper he constructed was a lineal descendant of Patrick Bell's shearing wagon; Hussey's cutting blade consisted of teeth that moved back and forth (like a haircutting machine). This idea had so many advantages that all future mowing and reaping machines were based upon it. ...

No sooner had Hussey's reaper begun to rattle across the fields than McCormick initiated a suit over patent rights. He made a practice of branding everyone who dared to build a reaper as a common thief. Who was first and whose was better? Already

third and fourth parties were becoming involved. Manufacturers like John M. Manny of Rockford, Illinois, also built reapers. For years McCormick fought patent suits against his opponents. We would not today be interested (for one of them had to win) and the testimony of the experts would be moldering in the archives, had it not been for the fact that some very great men were among the lawyers. Thus one day an attorney named Abraham Lincoln received a check from the Manny firm for five hundred dollars—by far the largest fee he had ever seen. He was requested to defend the firm's right to build reapers. Lincoln was ardently interested in the case, for he himself had come from the land. "It sent his imagination," writes Carl Sandburg, "back to the day when he went to the fields and harvested grain with scythe and cradle, when he had formed calluses on the inside of his hands from holding the scythe handle. Since that time the reaper had come. ..." Abraham Lincoln prepared to go to Cincinnati, where the litigation was to be decided. When he strolled into the courtroom in his customarily abstracted fashion, his clothes careless and awry, a fat manuscript in his pocket containing everything he had thought about machines, culture, and agriculture, he found another lawyer also representing the firm of Manny. The other lawyer was not pleased to see him. "Where did this long-armed baboon come from?" he was heard to say quite distinctly. (Later, in an effort at politeness, he said that he had compared Lincoln not to a baboon but to another animal: "I said that if that giraffe appeared in the case I would throw up my brief and leave.") To



The first page (page 193 of the annual volume) of Volume 3, Number 4, of *Mechanics' Magazine* for April 1834 carried this cut of an early Hussey reaper, which Obed described: "This machine consists of a frame of good oak or ash, sustained by two wheels forward, and one wheel or roller in the rear, and is constructed in the following manner: Two sills are connected by several cross rails; on these sills are fixed four posts; two top rails are framed to the tops of the posts, parallel with the sills, and connected also with cross rails, as seen in the plate. To the forward posts is hung the main axle, with journals running in metal boxes: on this axle the wheels are fixed with square boxes: these wheels sustain the forward part of the machine, and furnish the cutting power. Across the rear ends of the sills is fixed a plank floor of good pine, extending several feet beyond the right wheel. This floor is horizontal, and its distance from the ground will be the length of the stubble. On the front edge of this floor is fixed a row of iron teeth, pointing forward horizontally, forming a comb: the teeth are formed of two parts, one part above and one below, and joined at the points, forming a range of mortices, through which runs a saw with the teeth sharp on both sides: this saw is moved by a crank which receives its motion from the main axle. Two horses are attached to the machine and driven on the stubble, when the teeth are presented to the standing grain, which they receive between them, as the saw with a quick motion cuts it off, the morticed teeth forming a bearer above and below the saw. The velocity of the machine, while cutting, gives an impulse forward to the butts of the straws, causing the grain to fall backwards on the floor. As it accumulates on the floor, it is deposited or pushed off in heaps with a rake formed for the purpose, by the operator, who rides on the machine."



After page 4 in his book, Greeno included this portrait of Obed Hussey above an artist's nostalgic rendering of John Lane's blacksmith shop.

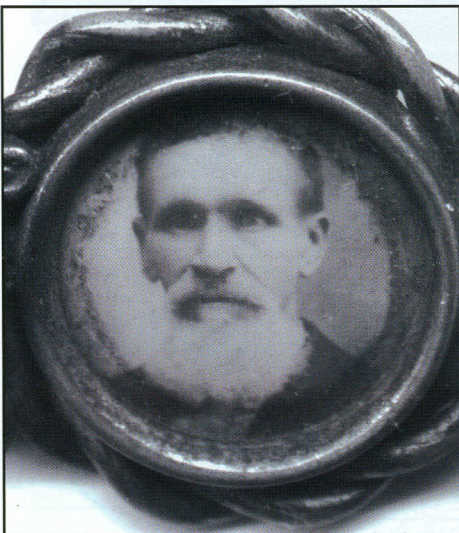


Lincoln himself he remarked, "Only one of us can talk." That one was not Lincoln, and the other lost the suit. This well-dressed and equable lawyer, who later became Secretary of War, was Edwin M. Stanton.

At first Hussey's reaper was far more popular than McCormick's. It was drawn from the front, with the cutter set off to



Here is the same portrait of Hussey that Greeno incorporated into an illustration in his book. Various authors claim that Hussey wore the patch because an eye had been injured during his youthful whaling days, but we have found no verification of the assertion.



Lane descendant Susie Hull believes that this photograph within a brooch is a portrait of blacksmith John Lane. Courtesy Susie Hull

one side. Mechanical fingers guided the stalks against the cutting parts, and the teeth cut the grain close to the ground. It fell upon a platform, where it was gathered together by the driver. Hussey's reaper might actually have won the race against McCormick's except for a peculiarity in the character of the inventor. He was like those inventors of the ancient world who imagined that once a thing had been discovered it could no longer be improved. Hussey dismissed all the experience of the next twenty years and stuck stubbornly to his model. The pliant McCormick learned from mistakes; he and his brothers worked incessantly to improve the machine. In the end he won out because of a tenacity that sprang more



Beginning from the front porch of the Lane residence, this flagstone pathway leads to the blacksmith shop and invites us to return to the time when John Lane made iron parts for Obed Hussey's reaper.

from business than engineering talent. In 1847 he founded a factory in Chicago. Four years later he had already built and sold one thousand reapers; ten years later twenty-three thousand. In ten years the business earned him more than a quarter of a million dollars. His profits increased steadily."

Jacob's first assumption in the guise of a fact is the notion that, while Hussey was busy making candles in Cincinnati, he heard someone mention that the invention of a reaper would be welcome and Hussey expressed his astonishment that no one had yet invented such a machine. This anecdote appears frequently in the literature about Hussey, but it is easily refuted. In 1912, Follett L. Greeno, whose uncle married Hussey's widow, published what



A publication of William Deering & Co., *Deering's Farm Journal* for May 1898 included an artistic drawing of the Lane homestead, which is incorrectly identified as that of Algernon Foster, who is incorrectly identified as a judge. (Algernon's father was a judge.) For reasons that we do not understand, the Lane farm was again misidentified as the Foster farm in a different publication in 1940. In all likelihood the *Deering's Farm Journal* drawing was made from the stereograph photo that dates to 1869 or the early 1870s. The artist has imaginatively included the reaper test of 1835, although you will have to squint to see it. The machine and a crowd of onlookers are depicted along the lower edge of the white field just above the roof of the house. In reality, the barley field was somewhat farther away.



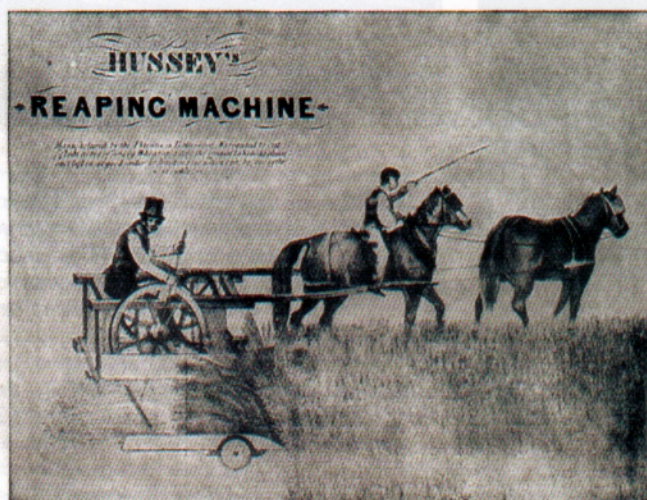
is generally considered the standard book about Hussey's inventions. The work is entitled *Obed Hussey: Who, of All Inventors, Made Bread Cheap*. On pages 6 through 9, Greeno states that Hussey was already designing his reaper in the early 1830s before he moved to Cincinnati and while he was still living in the factory of the Chenoweth family in Baltimore. Between the lines (below) are the relevant paragraphs from Greeno's book:

Mr. Hussey first began work on his reaper in a room at the factory of Richard B. Chenoweth, a manufacturer of agricultural implements, and the story of those early efforts is told by Sarah A. Chenoweth, a granddaughter of the latter:

"As a child, it seemed that I had always known Mr. Hussey. I



Built on the site of the original log cabin, blacksmith John Lane's two-story residence, photographed in November 2013, may date as far back as the 1830s and features three fireplaces (the third chimney is to the rear of the structure and out of view.)



(From An Old Print)

This illustration of Hussey's reaper was included in Greeno's book after page 12 and has often been reproduced. We think it depicts Hussey himself seated on the machine. The advertisement states, "Manufactured by the Patentee in Baltimore. Warrented [sic] to cut fifteen acres of heavy Wheat in a day, the grain taken as clean and left in as good order for binding as when cut by the sythe [sic] or sickle."

saw him every day of my life, for he lived in a room, the use of which my grandfather, Richard B. Chenoweth, a manufacturer of agricultural implements in Baltimore City, had given him at his factory. No grown person was allowed to enter, for in this room he spent most of his time making patterns for the perfecting of his reaper. I, unforbidden, was his constant visitor, and asked him numberless questions, one of which, I remember, was why he washed and dried his dishes with shavings. His reply was characteristic of himself, 'Shavings are clean.'

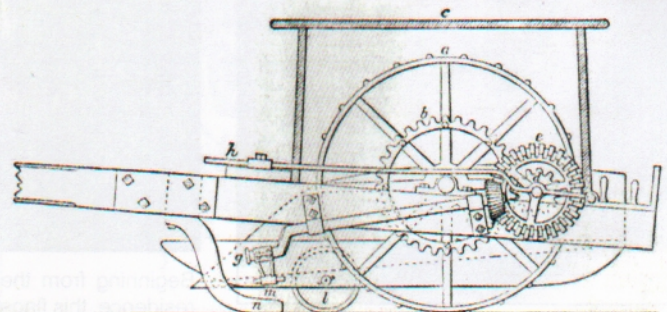
"At this time I was about seven years of age, having been born in 1824. Although very poor at the time, he was a man of education, upright and honorable, and so very gentle in both speech and manner that I never knew fear or awe of him. I do not know for a certainty how long he remained there,—several years, at the least, I think, but of his connection with the reaper, I am *positive*, for it was talked of morning, noon and night. To this day, my brother bears on his finger a scar, made by receiving a cut from one of the teeth of the machine. When, finally, the model was completed, it was brought out into the yard of the factory for trial. This trial was made on a board, drilled with holes, and stuck full of rye straws. I helped to put those very straws in place. Mr. Hussey, with repressed excitement, stood watching, and when he saw the perfect success of his invention, he hastened to his room too moved and agitated to speak. This scene is vividly impressed on my mind, as is also a remark made by a workman, that Mr. Hussey did not wish us to see the tears in his eyes."

Greeno continues by quoting from a letter sent by Sarah Chenoweth's brother, W. H. Chenoweth, to Clark Lane (a



Hussey's American Reaper

Across from the title page of Greeno's book, this cut depicts an early Hussey reaper. The operator raked the cut grain backward from behind the sickle bar. This machine offered a left-hand cut.



Gearing of Hussey's Early Reapers.

Following page 124 in Greeno's book is this side elevation of the gearing of Hussey's early reaping machines.



renowned industrialist from Hamilton, Ohio, who was living in Elkhart, Indiana, at the time) on the 25th of November in 1893 (between the lines, as before):

“... I can say that the name of Obed Hussey called to my mind the best friend of my boyhood days, as he was in the habit of keeping me supplied with pennies when I was short, and taught me how to put iron on a wood sled, and helped me to make my first wagon as he turned the wheel for me. You are right with regard to the date of the fingers and shaped cutters for Reapers, as I saw and handled it, to my sorrow in 1833 or '34 before the machine was finished and nearly cut my fingers off. I have the whole thing photographed in

my mind and can show the spot or within 10 feet of it where I lay on the floor. It was not possible to try it in Maryland, owing to the hilly nature of the ground, and was afterwards taken to Ohio for trial and was rebuilt there, or at least a part of it, but of that part (the rebuilding) I do not know for a certainty, but the bars, fingers and knives I do most positively remember, as I was a lad of some eight or nine years old with a mechanical turn of mind and was looking into what seemed strange to me, hence I cut my finger so bad that I carried the scar for a number of years. I very distinctly remember the incomplete reaper made by my old friend, Obed Hussey, as it was made in my grandfather's shop in Baltimore, Maryland, who was at that time the leading plow-maker of the U. S.

and that it was made either in 1833 or '34, as I would not have had a chance to see it if later than '34 as I was not at home until '38, when it had been sent, as I was told, to Ohio for trial and some parts had to be rebuilt.”

We think that W. H. Chenoweth must have witnessed Hussey's work prior to 1833, as Hussey was living in Cincinnati when he patented his reaper in 1833. Sarah Chenoweth's testimony states that the year was 1831. Incidentally, after the Patent Office burned in 1836, Hussey's patent was among those that were reconstructed. As Hussey was a Quaker, the Quaker communities of Baltimore and Cincinnati helped him. Jabez Reynolds and Thomas Kite, Jr., were partners in a Cincinnati iron foundry that became known as Reynolds & Kite. Kite's father was an eminent Quaker minister. Hussey arrived in the Queen City at some time before the winter of 1832–1833, and Reynolds and Kite quickly began helping him forge parts for experimental reapers built for Algernon Foster. The 1834 directory for Cincinnati lists Obed Hussey as a boarder at Mrs. Tucker's; his occupation is a “tallow chandler,” or seller of candles. According to James N. Gamble's address before the dividend meeting of Procter & Gamble on May 3rd, 1890, Obed Hussey employed William Procter in the candle shop in 1832, only three years before the successful test of Hussey's reaping machine.

Quoting Hussey's friend Stabler, Greeno thought that a prototype reaper in 1833 deserved the honor of being the first successful machine for mowing grain (between the lines, as before):

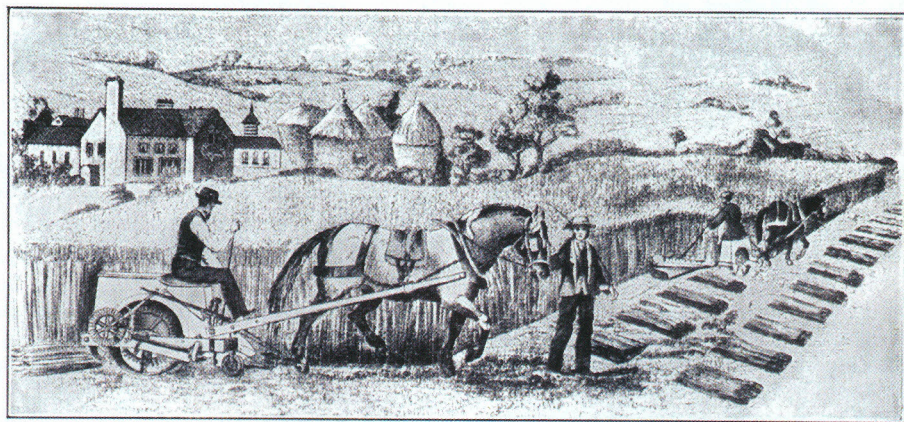
We may assume that Mr. Hussey must have begun on his large machine late in 1832, or early in 1833, at latest. During the early part of the harvest of 1833 he was in the field. “The machine was started,” Stabler tells us, “but owing to some part giving way, or some slight defect not apparent until then, it at first failed to work satisfactorily. One burly fellow present picked up a reaping cradle and, swinging it with an air of great exultation, exclaimed, ‘This is the machine to cut the wheat!’ ” Another account charges the breakage to a fractious team.

“After the jeers and merriment of the crowd had somewhat subsided, the inventor remedied the defect, and assisted by the laborers present—the horses having

Greeno borrowed this illustration from R. B. Swift's work on the invention of the reaper. Appearing after page 148, the cut, or engraving, depicts an early Hussey rear-delivery reaper.



Hussey's Rear-Delivery Reaper.  
(From “Who Invented the Reaper?” by R. B. Swift.)



Hussey's Side-Delivery Reaper As Used in England.  
(From An Old Print)

Greeno captioned this idyllic scene “Hussey's Side-Delivery Reaper As Used in England.” Included after page 180, the engraving features bundles of grain deposited in neat rows.





Here we see a fascinating stereograph view of John Lane's blacksmith shop and the Lane homestead beside the stone-lined creek. The road in the foreground stretches between Mt. Healthy and Hamilton. This photograph probably served as the basis for the artistic print that was reproduced on the cover of *Deering's Farm Journal* in 1898. The test of the first successful reaper occurred in a barley field about 500 paces from the smithy. Clark Lane, who was one of John Lane's sons as well as a well-known inventor and businessman of Hamilton, grew up here. He penned the note that is affixed to the back of this card. The stereograph view is in the collection of Susie Hull. Scan courtesy Pat Brown of Pat Brown Studios in Hamilton

The little stone smith shop as shown on the left is still in good condition & daily use. Marks the exact spot where the first reaper was made. And the vacant space to the right background is the same spot upon which grain was cut with a reaping machine - where both west of the Ohio River - which was done late in the month of June 1833. Clark Lane



Susie Hull provided this detail from one of the stereograph cards in her possession. From this perspective, John Lane's blacksmith shop and homestead overlap. Courtesy Susie Hull



In 1869 or the early 1870s, Hamilton (Ohio) photographer Eugene Brandt published these stereograph cards (early forms of 3-D). This view depicts the road between Mt. Healthy (originally named Mt. Pleasant) and Hamilton. The bridge crosses a branch of the West Fork of Mill Creek. To the left is the Lane blacksmith shop where parts for Hussey's reaper were forged. As may be seen, the smithy stood a little ahead of the house. Brandt was born in Copenhagen, Denmark. He established his studio in Hamilton after 1868. In 1870 and again in 1871, his photograph displays took top honors at the Butler County Fair. In 1877, he passed away in Santa Barbara, California. His son, Frank Erwin Brandt, was a well-known newspaper editor in Hamilton, and, over the years, he published many articles related to Clark Lane. The stereograph card is in the collection of Susie Hull. Scan courtesy Pat Brown of Pat Brown Studios in Hamilton

been removed—pulled the machine to the top of an adjacent hill; when, alone, he drew the machine down the hill and through the standing grain, when it cut every head clean in its track. The same machine was directly afterwards exhibited before the Hamilton County Agricultural Society near Carthage, on the 2nd day of July, 1833."

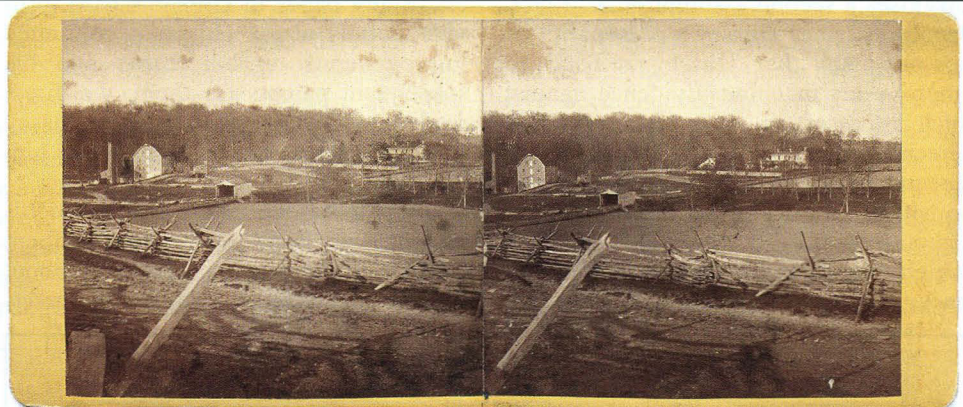
The secretary of the Society wrote an exceedingly favorable report. The group of spectators present at this trial drew up a testimonial that was very favorable indeed. On July 2, 1833, then, we are warranted in saying, the problem that had so long exercised the minds of inventors was solved.

Greeno explains the occasional references to "large" reapers as reflecting the fact that Hussey built reapers in two sizes.

Here is the bulk of the Carthage report that was published in full on page 194 in Volume 3, Number 4, of *Mechanics' Magazine* for April 1834 and on page 228 of Part 1 of Volume 3 of *American Railroad Journal* for April 19, 1834: "This may certify, that we, the undersigned, members of the Agricultural Society of Hamilton county, state of Ohio, at the request of Mr. Obed Hussey, attended an exhibition of a machine for cutting grain by horse power, invented by him. The experiment was performed at Carthage, in this county, about the first of July last, before a large company of spectators, composed of farmers of the neighborhood, the citizens of Carthage, and several from Cincinnati, who appeared to be united in the expression that it was a valuable improvement in agriculture. In our opinion the experiment was completely successful, although several impediments occurred during the exhibition by the breaking of some weak parts; these obstructions were plainly to be attributed to the imperfect manner in



which the machine was made, it being a first experiment, and experience not having yet taught how to proportion the strength of the several parts to meet the stress which each part might be subject to, on its trial, some pieces being of wood, which should have been of iron; but we have no doubt but all these imperfections can be remedied in a second machine. We were satisfied that the impediments referred to were not to be ascribed to any defect in the principle, for, while the machine was in operation, the performance was complete, until some part broke by the violence to which it was



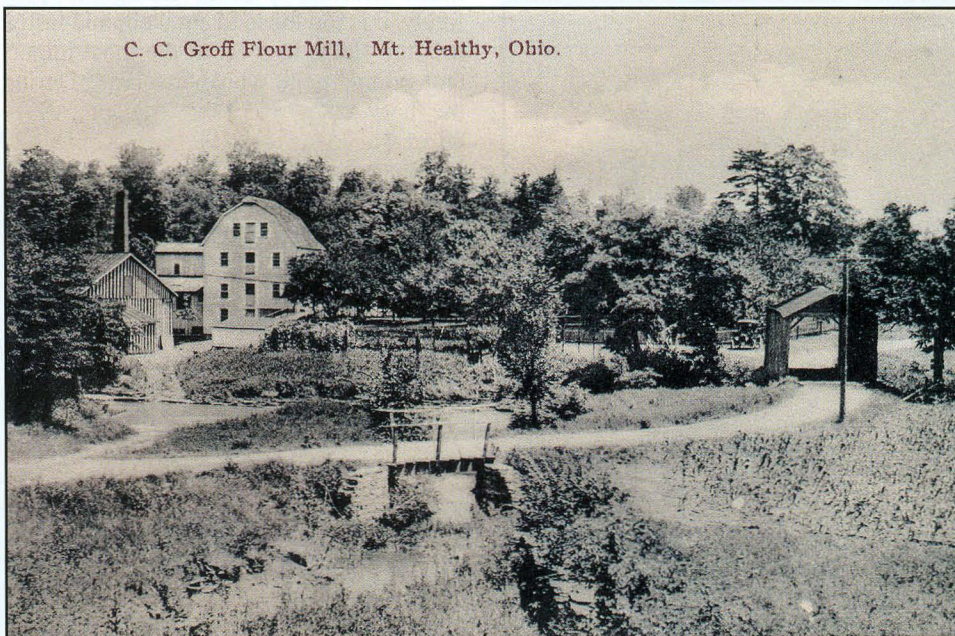
This stereograph scene from the late 1860s or early 1870s depicts the flour mill and the covered bridge, which Jedediah Hill (often given as Jediah) built in 1850. In 1981, an arsonist destroyed Jedediah Hill's mill, later the Groff mill, which is prominent in this view. The bridge was rebuilt on concrete abutments in 1982. The successful test of Hussey's reaper in 1835 took place in the barley field that was adjacent to the white house at the extreme right edge of the stereograph view. The charming split-rail fence, also known as a snake fence or worm fence, recalls a bygone era. The stereograph card is in the collection of Susie Hull. Scan courtesy Pat Brown of Pat Brown Studios in Hamilton



(Left): Architect Larry Pyle has identified this bucolic scene as "the small branch of the West Fork" running "between the Lane house and barn." The Hill mill stood out of view to the left; the Lane homestead, to the right. Behind the boys, "the West Fork flows over one of three dams built to retain water volume" for the water-powered mill "during dry periods," according to Pyle.

subjected, it having two horses attached to it, and they several times driven on a brisk trot; at this speed the grain was cut as well, or better, than when the horses were driven slow. The machine performed well ... The wheat was found to be cut much cleaner, and to be left in better order for binding, than when cut by the cradle. The saw which cuts the grain was made without a temper for cutting, consequently would not continue sharp long at a time; but no difference was perceived in the execution, the grain being cut equally clean, and fast, whether the saw was dull or sharp. This was attributed to the peculiar construction of the cutting apparatus. With regard to the quantity of grain which the machine is capable of cutting in a given time, we can only say, that we saw the machine move at the medium rate of three and a half or four miles per hour, cutting a swarth [sic] five feet three inches wide ... From the general satisfaction expressed at the exhibition alluded to, and our own impressions, we would recommend Mr. Hussey's grain cutter to the notice of all grain growers, being satisfied ourselves, that if future trials should equal the first experiment, it will be a valuable improvement to all large farmers." A brief testimonial by T. B. Coffin was printed immediately after the report; Coffin said that the "impediments" were a "loosening of a cog wheel" and "the breaking of a two-inch wood screw" that should have been a bolt. Coffin added that he had seen a later Hussey reaper built "in a strong and durable manner."

As mentioned earlier, Jacob's account



C. C. Groff Flour Mill, Mt. Healthy, Ohio.

This postcard's pastoral landscape depicts the C. C. Groff Flour Mill and a covered bridge over the West Fork of Mill Creek. To the left of the mill is a structure located where Jedediah Hill's sawmill stood. Obed Hussey's reaper was built there. Scan courtesy Pat Brown of Pat Brown Studios in Hamilton



disguises a second assumption as a fact. Jacob describes Hussey's personality as so obstinate that Hussey refused to improve his machine. Evidence against such an assertion is amply arrayed in Greeno's book; for example, on page 5, Greeno portrays Hussey as "extremely sensitive, modest and unassuming." Greeno states, "It was this reticence which has served to keep him in the background as the inventor of the reaper."

Many pages in Greeno's work provide details about Hussey's continued improvements on his reaper and his subsequent patents for them; we direct readers to Greeno to verify that Hussey could not have been as Jacob made him out to be.

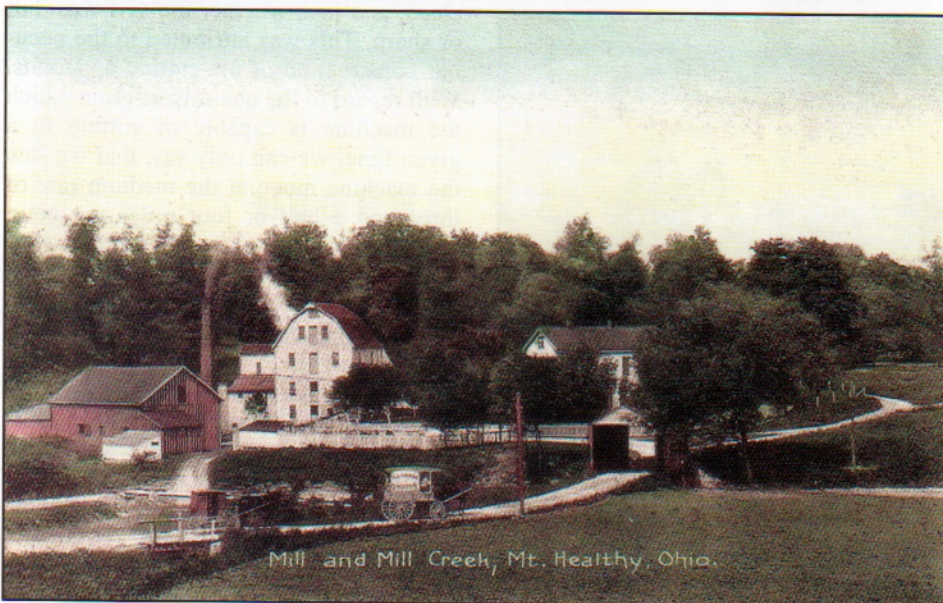
Given these two difficulties in Jacob's account, we hesitate to accept without critical reservation his narrative about Lincoln and Stanton, colorful and enter-

taining as it is. Who can tell what facets of that story (if any) are distorted?

As authoritative sources closest in time to the events under our scrutiny are to be given our greatest trust, we turn to a book published in 1854. After listing names of American and British inventors of reaping machines, most notably Patrick Bell, who was a minister in the Church of Scotland, Edward Stabler on pages 6 and 7 of his book entitled *A Brief Narrative of the Invention of Reaping Machines and an Examination of the Claims for Priority of Invention*, says, "None of these machines however, Hussey's excepted, were successful, or were used any length of time; nor is it necessary here to refer particularly to other attempts, about this time, or indeed, prior to this period, for they were equally unsuccessful; and their inventors cannot claim the merit of doing a thing, that was not in fact performed—making an efficient and successful Reaper. We may here remark, however, that so far as now known, no machine like Bell's, on the shear or scissor principle, has succeeded in this country; or as we believe, is ever likely to succeed. We have seen a number by different inventors, and all have failed to give satisfaction. They may work well for a very brief period and with keen edges; but as they become dull, the shears are forced apart by the straw and grass—particular the latter, and the machine fails, as it inevitably must do, in its allotted duty: and for very obvious reasons. If the shear rivet or bolt is kept tight, there is too much friction; if loose enough to play freely, it is too loose to cut well; and lastly, it is too liable to wear at the most important point of the whole machine. During the harvest of 1853 in England, every effort was made to uphold Bell's machine; in some cases prizes were awarded to it, though evidently partial; for in the face of these awards, some who witnessed the trials, and had used Bell's machines, laid them aside and purchased Hussey's. At the close of the season, as we learn from reliable authority, even the engineers who operated Bell's, frankly admitted that the American machine as exhibited by Hussey, was the better implement, owing to the arrangement of the guards and knives; Bell's required so much tinkering, that several machines were required to cope with one of Hussey's. At the recent harvest, (1854) the *Mark Lane Express* acknowledges that at the Royal Agricultural Societies' show at Lincoln, Bell's machine was 'at last fairly beaten' by Hussey's, including McCormick's, and Hussey's machine received the prize over



Henry Rogers, Jedediah Hill's son-in-law, built Obed Hussey's reaper in Hill's mill, which stood where the building at the left is standing in this photograph. When Hill passed away in 1859, Rogers continued the business and added a gristmill (the tall building). Beyond the mill to the right, the road that is seen crossing the covered bridge dwindled to little more than a farm lane in 1835, when the reaper was tested. We are grateful to CincinnatiViews.net for making available several of these scans.



As is obvious from the steam escaping into the atmosphere, the mill had been converted from water power to steam power before this photograph was taken. For many details about sites related to Jedediah Hill, we are indebted to Carolyn Kettell's article entitled "Flours and a Handsome Homestead," published on page 7 of the advertising supplement to *The Cincinnati Enquirer Tristate Magazine* for Sunday October 2, 1988.

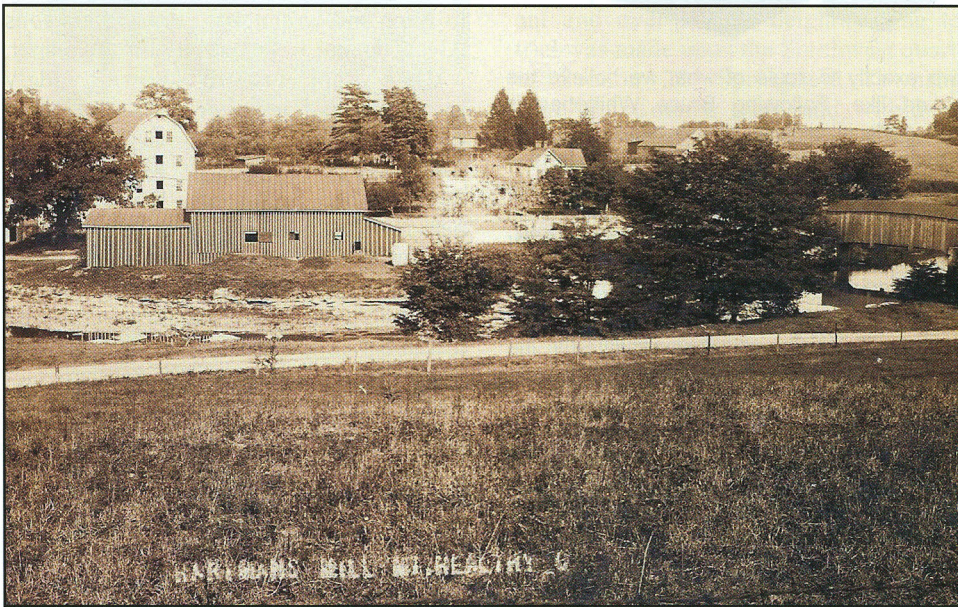


all others. It is just, however, to add, that far as we consider Bell's machine behind some of the present day, yet complex and cumbersome as it was, it combined more of the essential features of success, than any Reaper that preceded it."

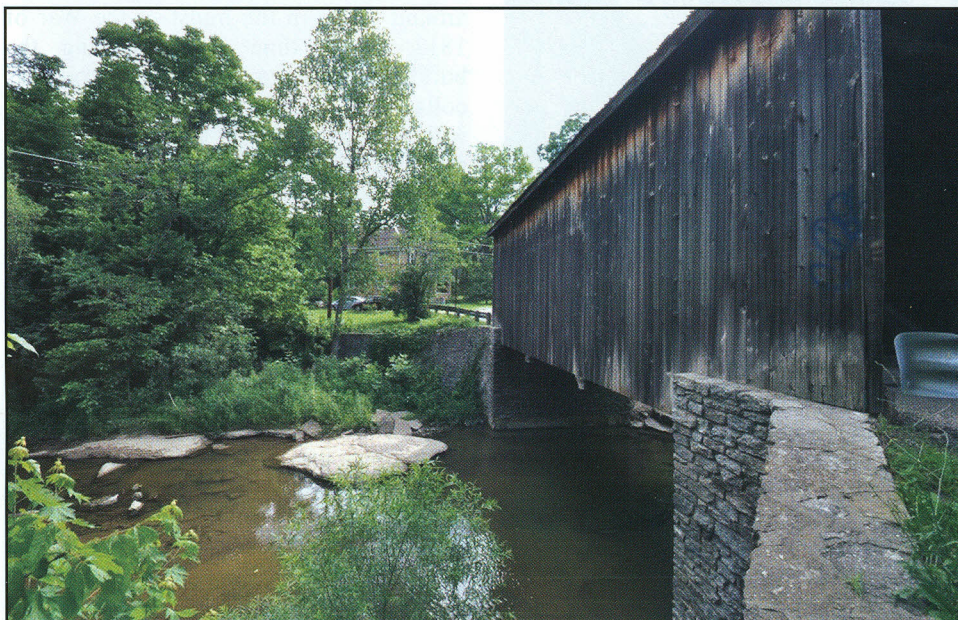
Three of Stabler's pamphlets were collected under the title *Overlooked Pages of Reaper History*, were republished in Chicago in 1897, and are available online. They lend additional support to the fact

that Hussey's reaper was the first truly successful machine of its kind. Postmaster of Sandy Springs, Maryland, Stabler repeatedly defended Hussey and his machines against claims that McCormick's reaper was a better invention. When, many years later, McCormick sought to prevent the renewal of Hussey's patents, Stabler wrote, "While C. H. McCormick has literally fattened on the agricultural public by the sale of his inferior and

cheaply made machines—for such I do consider them, both from my own observations and the report to me by those who have been induced to purchase them—Hussey has been pirated on from all quarters, and others reaping the reward of his labors. And I perceive by the papers on file, and accompanying the printed report (No. 16) that this same C. H. McCormick has actually petitioned against the renewal of Hussey's patent. It is really a very



Between about 1887 and 1911, Charles Hartman, Sr., ran the flour mill that is the tallest structure in this historical photograph labeled "Hartman's Mill." C. C. Groff purchased the mill in 1911. The striped building stood on the site of Jedediah Hill's sawmill where Hussey's reaper was constructed. Note Hill's covered bridge, which spanned Mill Creek in 1850. On the horizon to the right of center is a barn, and a field slopes to the right of it. The barley that was cut by Hussey's reaper grew in that field in 1835.



The Hill sawmill, where Obed Hussey's reaper was built, stood immediately to the left of this covered bridge over the West Fork of Mill Creek. The bridge was constructed in 1850 by Jedediah Hill and reconstructed in 1956 and 1982.

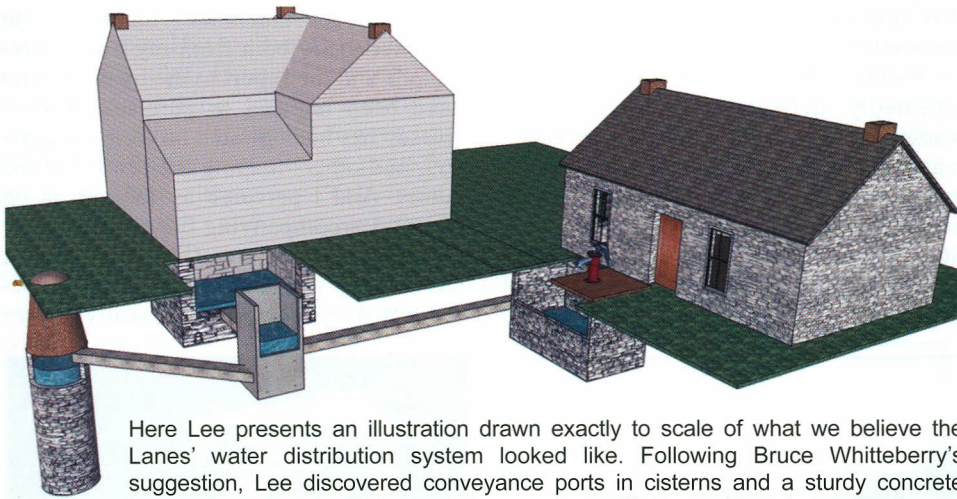


Hussey's reaper entered the barley field only a short distance down the road to the right and on the left side of the road, which, in 1835, was merely a lane into Jedediah Hill's farm.



Puzzled by a port 7' down the side wall of the surface well just behind the Lane house, Lee snapped a picture for further investigation. To our surprise, we discovered a channel leading away from the surface well. Over time, a portion of the passageway has collapsed as shown by the debris in the channel. Our curiosity was definitely piqued! Bruce Whitteberry, assistant superintendent and hydrogeologist for the Greater Cincinnati Water Works, suggested we investigate the possibility of a conveyance system by looking near the water well for a natural spring well that could have manmade channels leading to ports in cisterns within both the residential structure and the smithy. As Whitteberry explained, the port that we had observed in the water well could have admitted spring water from nearby.





Here Lee presents an illustration drawn exactly to scale of what we believe the Lanes' water distribution system looked like. Following Bruce Whiteberry's suggestion, Lee discovered conveyance ports in cisterns and a sturdy concrete structure that could be the top of the spring well. Normally a cistern fills from a rainwater catchment system, but Whiteberry suggested that, in this system, the cisterns are filled with spring water. Natural spring wells proliferated along Mill Creek, and we suspect John Lane also took advantage of clean spring water. This conveyance system allowed spring water to constantly fill the cisterns with the overflow draining into the 22' surface well. Should the spring well have ceased to function, the surface well would have been a backup water source. The side walls for the conveyance channels appear to be dry-stacked fieldstones that minimized overfilling by leaching excess water into the ground. The expert construction exhibited in the Lanes' excellent water system supports the likelihood that John Lane's parts for Obed Hussey's reaper displayed similar craftsmanship.



In 1847, William Lane built this suspension bridge on the Lane farm north of Mt. Healthy, Ohio. His brother Clark Lane said that William had been inspired when he studied the construction model for the Niagara Falls Suspension Bridge. By 1848, Charles Ellet, Jr., completed a temporary cable suspension bridge as part of the pre-construction setup for John Augustus Roebling's bridge over the Niagara River that was opened to public traffic in 1854. William completed his bridge a year before the temporary bridge at Niagara was open; accordingly, the Lanes called William's bridge the first suspension bridge in America. As other American suspension bridges had been erected before the Niagara project began, the Lane suspension bridge was not the first but among the first completed cable suspension bridges. Lane descendant Susie Hull provided this photograph featuring the suspension footbridge in the foreground and the stone arch bridge for Hamilton Pike in the background. Note the corner for the stone pier that supports the left end of the cable bridge. The absence of deck sag demonstrates good functional support by the cable suspension system.

hard case, that a poor man and one of the most deserving in the community in every sense of the term, should thus fail of a just reward when he has done so much for the benefit of others."

In what way did Obed Hussey discover John Lane's blacksmithing talents? Greeno cites a letter from the Lane family that gives the answer: Luke Foster, judge of the court of common pleas of Hamilton County and owner of a farm 3 ½ miles east of the Lane farm, introduced Hussey to Lane and volunteered to have his sons Algernon and Jefferson pay for the reaper.

Clark Lane is well known, widely respected, and generously chronicled in the history of Hamilton, Ohio. (In *Engineers and Engines Magazine* for February and March of 2014, a lengthy, heavily illustrated article entitled "Surprises in Hamilton, Ohio" by Mark Ohlde, Neal Simpson, and Robert T. Rhode features numerous facts pertaining to Lane's extraordinary accomplishments as an inventor, industrialist, and benefactor.) Lane left an unpublished memoir entitled *Reminiscential*, which was typed in 1951, long after Lane's death in 1907, and which the Lane Public Library has. Clark Lane was raised on the Lane farm, which was established in 1793, when Hussey was probably one year old. On August 20th of the following year near Toledo in northwest Ohio, General Anthony Wayne (known as "Mad Anthony") defeated Shawnee Blue Jacket and his confederated tribes, ending their hope for control of the Northwest Territory. John Lane's blacksmith shop was built around 1813, in the midst of the War of 1812. At the time of this writing, the building is still standing, but its roof has collapsed. Clark Lane opens his memoir with the day he himself was born. Between the lines (below) are excerpts that have not been edited and that reflect Lane's characteristic eccentricities of sentence structure:

From the Record I learn that April 5th A. D. 1823 I first saw the light of day from the one room log house then upon the farm of my parents — John and Rosanah Lane and within two rods of my present home, and the place I now write.

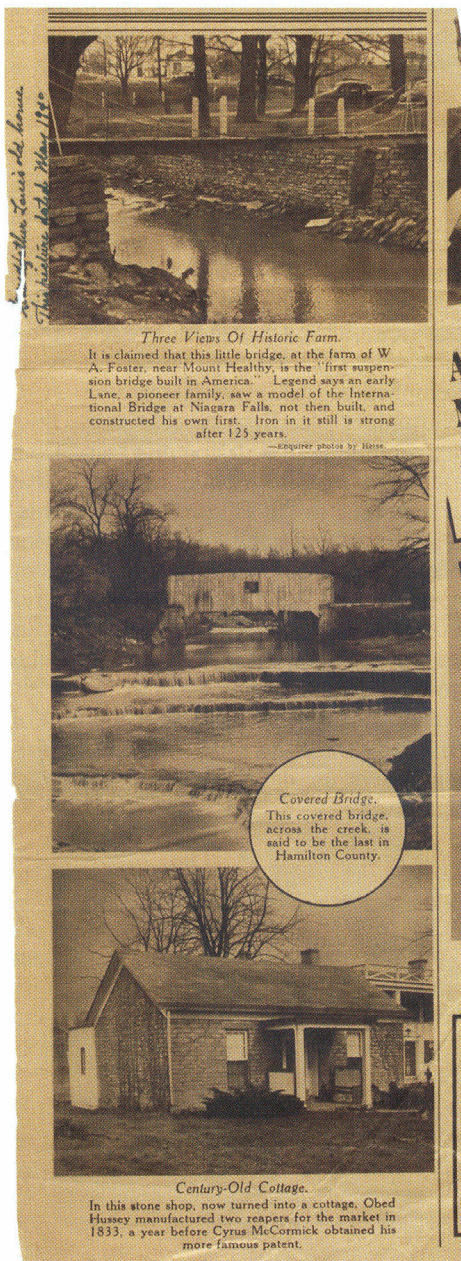
My first recollection of a positive and business nature was most probable at the age of between six, and eight years, when my Father required my service in the Smith Shop. I stood upon a half bushel to blow the bellows — heating the links and watching the forge fire, while father did



the welding of same into trace chains for our neighbors.

Thence onward at intervals I was taught to make nails, rivets and chains and advance in the art of Smithing.

My Father's Book of 1835 now before me, though crude of keeping does witness



Susie Hull offers *E&E* readers this newspaper clipping from the third page of the Art Gravure Section of *The Cincinnati Enquirer* for Sunday May 19, 1940. Well-known photographer Herb Heise has provided two views of the Lane farm, mysteriously misidentified as the Foster farm, which was in nearby Glendale, and a third view showing the covered bridge. Note the automobiles parked between the road to Hamilton and the suspension bridge, which boasts handrails supported by white posts. Note also the extension behind the blacksmith shop, which had been repurposed as a cottage.

that early in that year he and my present Octogenarian friend and neighbor Henry Rogers constructed and put into practical and successful operation what I am quite sure was the first Reaping Machine ever built upon, and that cut grain within limits of the Northwest Territory.

My eldest brother (Isaac) and I rendered material services toward the making of this machine, which was the Hussey Patents. About July first of that year, 1835 and in presence of many hilarious, expectant and over-pleased neighbors the test trial was made upon the Southwest quarter of Section 28, Springfield Township, Hamilton County, Ohio and within 500 paces of where I write. (See Butler Co. Ohio Democrat date of March 13, 1890)

The machine was pronounced a complete success. A threshing machine and horse-power was made by the same persons for Jefferson and Algernon Foster. The Reaper was loaded upon wagons and by the Messrs. Foster was taken to La Porte County, Indiana for use during harvest season of that year. (1835)

The sickle, sickle bar and fingers of 1835 made by us were the same as those now in use — the only improvement ever made upon them has been through mechanical perfection of machinery which is used for the better and perfect formations of the parts aforesaid.

From 1837 to near 1845 my Father and my brothers were the makers of many of the common style of farm wagons, doing also general smithing and plow work. During the year 1838 we made the first spring market wagon.

My place was in the smith-shop with older brothers until about 1841. Then being 18 years of age and brothers having begun life to themselves, I was put in charge of shops. Within three years afterward I was credited the ability to iron wagons as complete and in less time than any other smith in Springfield township, Hamilton Co., Ohio.

...[In this place is a paragraph about Lane's efforts to learn how to read and write.]

Midsummer of 1844 found me past 21 years of age and at Hamilton, Ohio with a contract on hand to iron fifty wagons single handed and with my own hands alone. And all to be complete for coming spring trade.

In a letter to the editor dated March 10th and published on March 13th, 1890, in the *Ohio Democrat*, a Butler County newspaper, Lane added details of such signifi-

cance that reprinting the article in its entirety is warranted. Lane's letter appears without corrections between the lines (as before).

To "Inquirer" who from Oxford, Ohio, asks the DEMOCRAT for facts as to "the origin of the Reaper and Mower," please say that on the Cincinnati and Hamilton pike near midway between the two cities, may yet be seen the buildings in which the first Reaper was made; i. e., it was the first reaping machine made upon terra firma of Northwest territory, and that ever cut grain north, west or southwest of the Ohio river in manner and condition to assure the farmer that the time had come when his grain could be economically harvested with machinery.

Prior to July 1835, in the stone building not twenty paces from where I write my father, John Lane, forged and furnished the iron and steel parts for said reaper, and Henry H. Rogers, at his place of business not five hundred paces distant finished and fitted up both iron and wood work to a finish and working condition of the same.

The work was done for Jefferson and Algernon Foster, more or less under the personal superintendence of Obed Hussey, who furnished patterns, drawings and some of the castings used.

In the first ripening grain of that year on the farm of Jedediah Hill, and now the home of Mr. Rogers, the Obed Hussey Machine made its first cuts and proved its great superiority over all former efforts in this class of invention and manufacture.

I think the truth is spoken when I assert that never before Hussey's time, nor never since his invention has either reaper or mower been a success in the field with any other cutting device than with the sickle and finger, or fingergard used on the machine here A. D. 1835, to conform with Mr. Hussey's order and invention.

As aforesaid, our machine was made for Jefferson and Algernon Foster. On day of its trial on the Hill farm a host of farmers were present. The Fosters were there with teams, and so well were they pleased with the working of the machine after a few rounds had been as clean and as perfectly cut as any since have cut they ordered it taken apart and loaded upon their wagons. Together with a threshing machine we had also made for them, were put aboard and taken directly to Laporte county, Indiana, where both machines done service through remainder of the harvest of that year.

Mr. Rogers, my eldest brother, Isaac,





Here is an artist's depiction of the suspension bridge. The illustration appeared on page 63 in *Popular Mechanics* for May 1913. We find the art a tad fanciful, but it supplies charm that amply compensates whatever it lacks in accuracy.



Dry-stacked fieldstone defines the side of the Mill Creek stream, near the house, and has survived well over the many years of rushing flood waters.



Here we see the dry-stacked stone suspension bridge abutment on the side of the branch of Mill Creek where the Lane house still stands. While the base of the pier remains in good order, the top level has deteriorated over time causing the loss of the anchor stones that held the cable support tripods.

and myself, who assisted father in the shop, and Israel and J. S. Hill still live to answer any further demands.

CLARK LANE

Mt. Healthy, Hamilton county, Ohio, March 10, 1890

Jefferson and Algernon Foster hauled the reaper to the farm of their younger brother, Clinton Foster, in LaPorte County [as the name is customarily capitalized], which was only starting to be settled in 1835. Eleven years later, Clinton received Patent Number 4,461 for a machine to cut grain or hemp and to rake it from the platform. In 1848, Jacob J. Mann and his son Henry F.—also of LaPorte—invented a harvesting machine that cut the grain and gathered it into a bundle at one side; the operator determined when the bundle was the proper size to be dropped onto the ground. The Manns received a patent in 1849, but McCormick considered it an infringement on his patents and took legal action, which the Manns countered. The Manns' machine had defects that the inventors addressed, culminating in a favorable performance of the machine at the state agricultural fair in Lafayette in 1853 and another patent in 1856. For twenty years or more, LaPorte County witnessed multiple reaper developments.

For now, let us return to the reaper's earliest successes in Ohio. Pages 56–58 in Greeno's book provide additional commentary from Lane, whose words form a virtual time machine to take us back to that memorable day in 1835. (The reference to "S. F." probably is a misreading of Lane's handwritten J. F., for "Jefferson Foster.") Selections from Greeno appear between the lines (as before).

Mr. Lane goes on to say that one of the machines was taken to La Porte, Indiana, and there put to work. Another was sent to Illinois.

"The turning and fitting for these machines was done at the mill of Henry Rogers, about 500 yards away from the little shop. In the following copy of a recent affidavit sent us, date not given, these last matters are sufficiently substantiated."

Mr. Lane continues:

"Who invented the Reaper? The full, honest answer is that Obed Hussey invented the Reaper.

"Between April and July, 1835, John Lane and Henry Rogers (with Isaac and Clark Lane assisting in the work) at their respective places of business one mile north of Mt. Healthy, Hamilton County, Ohio, made to order of Obed Hussey one Reaping machine for S. F. and Algernon Foster, then of the same County and State. Said Reaper was made to conform to or with drawings and patterns made and furnished by the said Obed Hussey, who also superintended the work of making the machine, and witnessed its trial in the field near the middle of June, 1835, in presence of many farmers, mechanics and others near by where the same was made; and when and where it was delivered to the Messrs. Foster's, who took this same reaper to La Porte County, Indiana, for the reaping season of the same year.

"For the iron and steel work done as aforesaid books in my possession show that fifty-three and 69/100 dollars was paid by Messrs. Fosters, July 6th, 1835, to John Lane and by him receipted for in full, etc., etc.

"The cutting device we then made for this machine evidently was the invention of Obed Hussey; and it was as near exactly the same in all material parts to the cutting device now universally in use, as the hand made sickle could then or now be made. The sections of sickle were forged steel blades V shaped, having serrated or sickle cut edges, and riveted to vibrating bar passing through slotted fingers, substantially riveted to the apron or table upon which the cut grain fell in position to be raked, or 'forked off.'

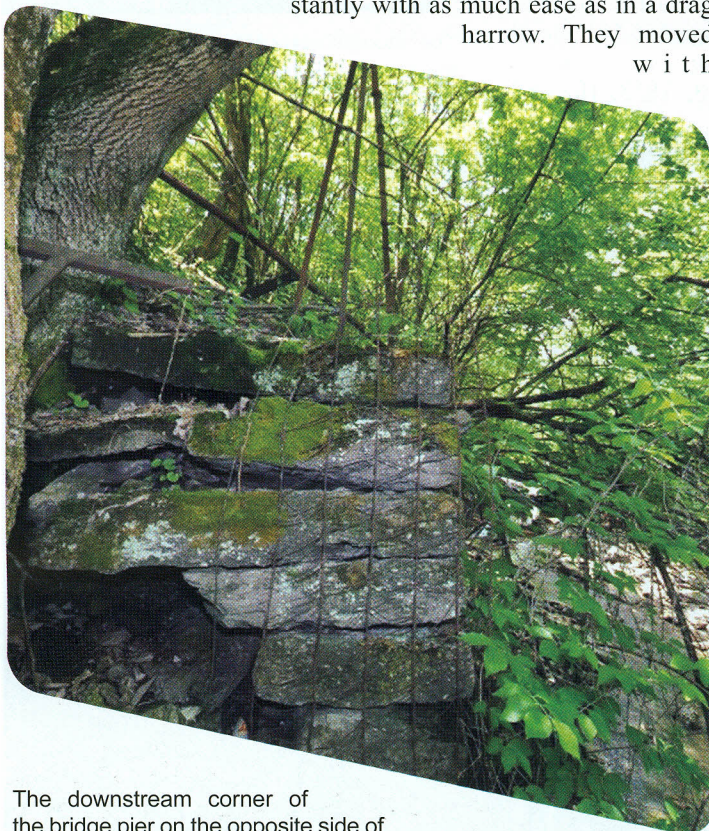
"This Obed Hussey machine cutting in a good average stand of bar-



ley, June, 1835, was light draught for two horses and left as clean and as evenly cut stubble behind it as the best of machines now do the same work. But one fault, if any, with this first reaper was *the lack of one or more cogs* in the driving wheel that gave motion to the sickle, which required the team to walk a bit too fast for teams of habitual, or slow motion.

(Signed) "CLARK LANE."

Greeno says that, on the 6th of July in 1835, the same year when Hussey proved the success of his reaping machine at the Hill farm, Hussey was in Palmyra, Missouri, to demonstrate two of his reapers at the farm of longtime friend Edwin G. Pratt. Greeno tells the rest of the story: "The machine 'excited much attention, and its performance was highly satisfactory.' The results of the trials were published in the *Missouri Courier* in August or September of 1835. The machines were sold for \$150 each. ... In 1836 Mr. Hussey was in Maryland, at the written solicitation of the Board of Trustees of the Maryland Agricultural Society. The fame of his reaping machines in the state of New York, and the far West, had spread ... The machine was operated at Oxford, Talbot County, on the 1st of July, in the presence of the Board and a considerable number of other gentlemen. Its performance was perfect, as it cut every spear of grain, collected it in bunches of the proper size for sheaves and laid it straight and even for the binder. On the 12th of July a public exhibition was made at Easton, under the direction of the Board; several hundred persons, principally farmers, being present. This same machine was sold to Mr. Tench Tilghman, for whom it cut 180 acres of wheat, oats and barley during that season. The report of the Board of Trustees of the Maryland Agricultural Society stated that 'three mules of medium size worked in it constantly with as much ease as in a drag harrow. They moved with



The downstream corner of the bridge pier on the opposite side of the stream reveals the cable support tripod still anchored in the top stone.

equal facility in a walk or trot.' In 1837 the machines were sold in various parts of the country. One at Hornewood, Md., one at West River, and several others throughout the state. One of the machines sold in 1838 to the St. George's and Appoquinomick Ag. Society cut several hundred acres of grain, up to 1845, and was then in good repair."

As Greeno implies, it was in 1836 that Hussey moved back to Baltimore from Cincinnati to found a thriving reaper manufacturing business that could rival Cyrus Hall McCormick's expanding trade. According to page 3 of the *Torch Light*, a Hagerstown newspaper, for February 23, 1837, Hussey initially established his business in the shop of Horatio Watkins between Hagerstown and Williamsport, Maryland. As Hussey is not listed in the Cincinnati directories for 1836 and 1837, and as the *Torch Light* says he is "of Cincinnati," Hussey must have moved from Cincinnati to Maryland in late 1836. Not long after, Hussey opened a shop in Baltimore. With the national financial downturn known as the Panic of 1837, Hussey might have struggled to make a living at first.

Page 229 in Volume 23 of the *Transactions of the New York State Agricultural Society* for 1863 says that, in 1842, Obed's brother Thomas R. Hussey began selling Hussey reapers in Auburn, New York. Readers of *The Steam Tractor Encyclopedia* (by John F. Spalding and Robert T. Rhode) will want to know that the later firm of Bowen & Quick bore a direct lineage to the Hussey business in Auburn. In the 1840s, Obed Hussey had entered into partnership with his foreman, Thomas Judge Lovegrove. At least one document refers to the business as Hussey & Lovegrove and says that the company supplied engines for a new mill. Not many years later, Lovegrove was instrumental in helping Baltimore obtain steam-powered fire engines. He patented a centrifugal method for making pipe, and he eventually established Lovegrove & Company in Philadelphia, where he sold many machines, including stationary and portable steam engines.

Something about being the first is like a magnet attracting contrary claims. For more than a century, many pages have been expended to defend the fact that Hussey invented the first successful reaper. One of the foremost contradictions first appeared on page 792 in Volume 2 of *History of Western Maryland* by J. Thomas Scharf (Philadelphia: Louis H. Everts, 1882). Scharf asserts that Jacob R. Thomas of western Maryland was a cousin of Obed Hussey and that Hussey (and, by extension, McCormick) capitalized on Thomas' 1811 invention of the sickle-bar mowing principle while Thomas disappeared into obscurity. McCormick was born in 1809, the year when Thomas began to design a mowing machine; Hussey was then 17 years of age. On the strength of Scharf's book, a historical marker has been installed to commemorate Thomas' prior invention. Scharf writes, "The pathetic story of Jacob R. Thomas is the same so often repeated in the lives of inventors and discoverers. The spark of genius went out amid the vapors of poverty, while his quick-witted imitators reaped the golden showers which should have been poured into his own lap." A problem exists in Scharf's contention, and it casts doubt on his hypothesis: namely, Thomas does not appear to have been a cousin of Hussey. Also, there appear to be no documents that place Hussey where he could have seen Thomas' mower.

In his book entitled *Cornelius Aultman, C. Aultman & Co., and the Aultman Co.* (Enola, PA: STEMGAS Publishing, 1967), Professor Lorin E. Bixler says that, in the winter of 1848–1849 in Greentown, a village of three-hundred inhabitants nine miles north of Canton, Ohio, Cornelius Aultman made the patterns and built five reapers based on Obed Hussey's design. In 1847, a few



had been made at Martin's Ferry, Ohio. They and Aultman's reapers were the first machines of their kind to be built in Ohio. Michael Dillman, a well-to-do farmer in Summit County, Ohio, was so impressed with Aultman's reaper that he offered to join Aultman in a partnership to manufacture reapers.

Aultman and Dillman chose the town of Plainfield in Will County, Illinois, as an ideal site for their new business. In Plainfield from 1849 to 1850, they constructed thirty-seven reapers. Area farmers who bought the machines gave them a good report.

Meanwhile, Hussey learned that Aultman and Dillman were producing his machine in the West. Hussey had done little to market his reaper himself, but he was quick to claim patent rights. In the spring of 1850, he hastened to Illinois and informed Aultman and Dillman that they owed him royalties on all the reapers they had sold.

The partners bargained with Hussey and ultimately agreed to pay him fifteen dol-

lars for each reaper. In the fall of 1850, Aultman returned to Greentown, where, with new partners, he established a machine shop.

Eventually, Aultman formed the C. Aultman Company of Canton, Ohio, and, later, he joined Henry Taylor in founding the Aultman-Taylor Machinery Company of Mansfield, Ohio.

As Greeno underscores, even though William N. Whitely did not favor extending Hussey's patent, Whitely wrote truthfully that Hussey had invented the first successful reaper. Whitely was an important builder of agricultural implements in Springfield, Ohio. He mentioned that the first Hussey reaper that was taken to Algernon Foster's farm in Glendale, Ohio, was equipped with a reel but that it was removed shortly after the reaper was built. Whitely said the same reaper boasted an extra rear platform that enabled grain to be raked to one side more effectively. Whitely added that, in 1860, he had seen two of the reapers on the Foster farm and that he guessed they had been there since 1835. These machines were likely the Reynolds & Kite prototypes.

As Greeno's book is available online, and as it gives a fairly thorough account of the various awards that Hussey's reaper won, we will not provide here a listing of the medals and premiums that the machine earned. According to page 2 in Volume 41, Number 12596, of the *Daily National Intelligencer* for July 8, 1853, Hussey's

improved reaper was cheered in Plymouth, England, after a demonstration at a great agricultural exhibition. Greeno offers similar testimonials to the success of Hussey's reaper in the United States and abroad.

The first successful reaper was built and tested in an environment where excellence of workmanship and being first were



The wrought iron cable saddle was forged to the top of the iron tripod and features dual side saddles.



The wrought iron tripod with  $\frac{7}{8}$ " square legs and with a forged cable saddle is firmly anchored into the stone of the bridge abutment of William Lane's suspension bridge.



Look carefully to see the stranded suspension cable with the attached suspender irons, which nature has almost reclaimed, lying beside the stone bridge abutment.



familiar. Always curious for the next best idea, Clark Lane's brother William, who, according to Clark, had been working in New England, detoured to Niagara Falls on his way home in 1846 and happened to investigate the preparation for building the Niagara Falls Suspension Bridge. By 1848, Charles Ellet, Jr., completed a temporary cable suspension bridge as part of the pre-construction setup for John Augustus Roebling's bridge over the Niagara River that was opened to public traffic in 1854 and for the railway in 1855. Most intrigued by the temporary bridge design, William studied the construction model for the final suspension bridge.

Returning home to the Lanes' 38-acre farm in Mt. Healthy, and with the help of his brother Clark, William set out to build the Lane cable suspension footbridge in 1847. The Lanes' home and blacksmith shop are separated from the barn by the stone-lined

branch of Mill Creek. When we recently walked to the side of the Lanes' house, we could easily see why William and Clark selected that specific location on Mill Creek to build. At that spot, the stream conveniently narrows in front of the farm buildings on the far side and in line with the house and smithy, allowing for a shorter span and a suitable crossing. The Lanes' bridge design used 9 suspender irons of  $\frac{1}{2}$ " diameter on a spacing of 40" attached to the catenary cable for support of the 54" wide wood deck that was laid upon 12" high timber beams resting on dry-stacked flat fieldstone abutments measuring 6' square and 8' high. Eighteen strands of Number 8 wrought iron wire were laced straight (not twisted in the traditional wire rope configuration used today) into a  $\frac{3}{4}$ " bundle to form the suspension cable. At each end of the bridge, the cable fit into a saddle, or groove, in the top of a 58" high metal tripod firmly anchored into the stone abutment and attached to deadman anchors. Four tripods completed the bridge. Each cable end was attached to a chain that connected to an iron hook on the end of the deadman staybolt. Precise side-to-side leveling of the bridge was accomplished by adjusting the length of each chain.

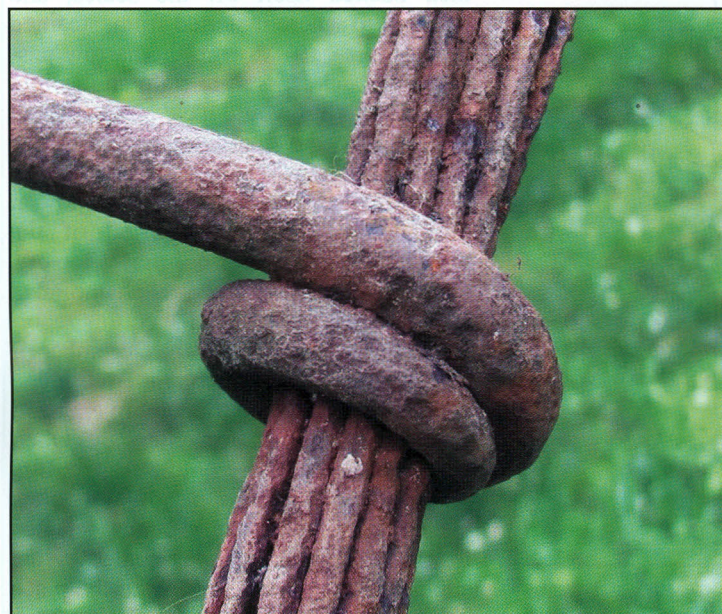
Not the first but among the first completed American cable suspension bridges, the 30' span was going strong in 1940, nearly a century later. Eventually, 3" angle iron girders were added to strengthen the sides. We can easily assume that Obed Hussey enjoyed the same level of construction quality for his reaper parts that were forged in the Lane blacksmith shop as that used for the bridge.

When we go forward a few years and follow Clark Lane's career, we find evidence related to his talents and skills. Page 1 of the booklet entitled *Lane Public Library: Commemorating the Years 1866–1997* by Dr. James E. Schwartz describes Clark Lane in 1844: "In Dayton, Lane quickly found work in the shops of Lemmon and Ross. He began work there on edge tools and machine forging, a new branch of smithing for him. He was quite accomplished—the equal of the oldest and best workmen in Dayton." In 1846 (the same year that William was inspired to build a suspension bridge on the home place), Clark built the stone and iron cells in the Butler County jail in Hamilton. On page 2 of the same publication cited above, Dr. Schwartz writes that, "well over a century later," the cells were "so well constructed that the wreckers noted that it [the jail] did not want to come down." Clark supplied the ironwork for the paper mills of McGuire, Kline & Ervin and for Beckett & Rigdon; he could not have obtained the contracts without having excellent skills and a reputation for high quality.

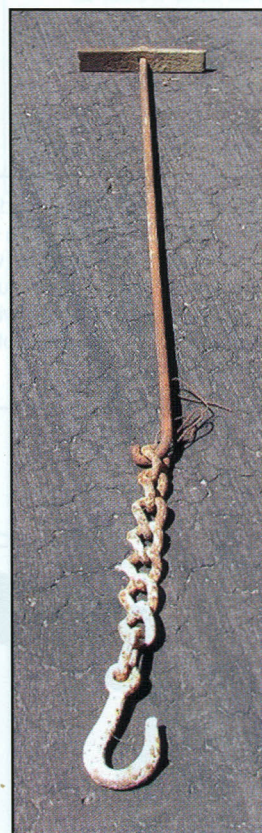
In 1855, at age 65, Hussey tested a steam traction engine that he had designed to pull plows. Early that year, he attempted to patent his engine and plow in England, but his



Here are the wrought iron suspenders that were forged around the  $\frac{3}{4}$ " diameter bundle of 18 strands of Number 8 wire laced straight (not twisted in the traditional wire rope configuration still used today). There may have been a single spiral wire wrapped around the bundle to maintain a cable configuration.



This iron suspender tightly surrounds the 18-wire cable bundle. Note the tapered end of the suspender iron as it snakes around the cable.



Found attached to the suspension cable, this deadman staybolt probably is not the original from 1847, but the wrought iron cable adjustment chain is authentic to the period.



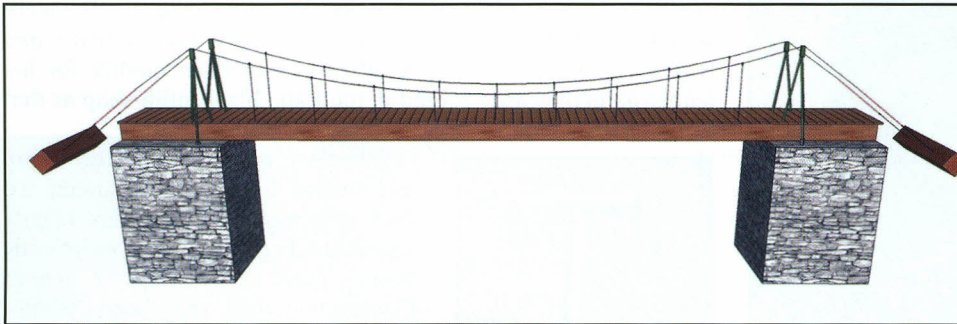
application through George Tomlinson Bousfield “did not proceed to the Great Seal,” a polite expression that means the application was rejected. (See the full patent communication.) Hussey hoped to exhibit the engine at the Universal Exposition of Paris, France, to which he had been appointed a commissioner, but French Emperor Napoleon III withdrew his offer permitting Americans to enter exhibits at any time, and Hussey, who had delayed his application, could not participate. Hussey’s enemies started a rumor that his equipment had lost in a French competition, and Hussey had to refute the falsehood in ads in Baltimore papers. We wonder what Hussey thought of the fact that his chief competition, McCormick’s reaper, won a Grand Medal of Honor at the French exhibition. (See page 365 in Volume 6, Number 23, of

*The Country Gentleman* for the 6th of December in 1855.)

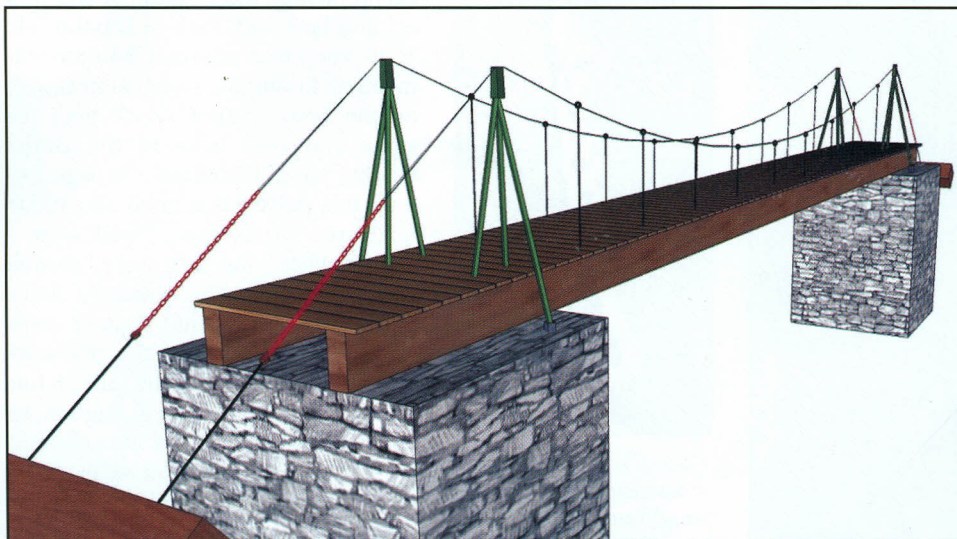
Page 84 in Volume 11 of *The American Farmer* for September 1855 offers this extraordinary account of Hussey’s traction engine, which was assembled at Hussey’s factory that *Matchett’s Baltimore Director for 1855–56* reports was located on Eastern Avenue between Eden and Spring: “We have been aware, for some time, that Mr. Hussey, of this City, the Inventor of the Reaping and Mowing Machine, was engaged in constructing a Steam Plow, with the design to exhibit it in the French Exhibition, in Paris. We learn that he has so far completed his invention as to get up Steam on two different occasions, and Steam along the streets, several squares in the neighborhood of his manufactory. The stone pavements did not, however, afford a good opportunity to test its ability to



This daguerreotype of Obed Hussey is dated around 1850, only a few years before Hussey began to experiment with a steam traction engine for plowing.



Lee drew to scale this side-view of William Lane’s suspension footbridge with deadman cable anchors. As may be seen, the bridge features a length of 42’ and a span of 30’. The deck support timbers (probably from the Hill sawmill) rest on abutments, each of which is formed of dry-stacked field stone 6’ square and about 8’ tall. The suspension cable support is from a 58” high iron tripod with 7/8” square legs positioned on an equilateral triangle with a 17” base and fitted with 2” square iron feet (not longer than 6”) that rest in 2½” square holes drilled into a 6” thick flat field stone and wedged into place with stone.



Here is Lee’s CAD drawing depicting the actual placement for the cable support tripods. Two legs penetrate the wood decking, and a third leg remains to the outside. All three legs are firmly anchored into 2½” square holes. The chain that is attached to the deadman staybolt allows for tension adjustments to maintain a level walkway.

plough, but we understand that its manageable qualities were pretty clearly manifested. If we can credit our informant, the machine, by its own power, started from the manufactory, down a narrow passage, through the gateway, and along the streets, turning several corners, and into the yard of another Manufactory, on to the scales, where it was weighed; weighing, with water and fuel on board, about six tons. It then backed itself off the scales, and returned to where it started from, steamed through the gate-way, up the narrow passage and backed itself at right angles into a shed, where it would have been difficult to have placed a two-horse wagon by the use of the horses.”\*

Hussey demonstrated his steam plow at the Eighth Annual Exhibition of the Maryland State Agricultural Society. Tench Tilghman, who often championed Hussey’s inventions, published this report in *The American Farmer* for December of 1855: “The committee appointed to judge of the merits of the ‘Locomotive Steam Ploughing Engine,’ invented by Obed Hussey, of Baltimore, Md., respectfully report, that precisely at the appointed time the engine entered the grounds selected for the exhibition, and was guided by the engineer with perfect facility to the place indicated by the committee. Three large sized right hand flushing ploughs were attached . . . These ploughs were attached



by log chains at distances varying from fifteen inches to five feet, and each managed by a separate ploughman, consisting of two gentlemen from the Western and two from the Eastern Shore, at the head of whom, was James T. Earle, Esq., the worthy President of the Society. The engine was then started at a uniform speed equal to that of a quick walking horse; the ground was thoroughly broken to a depth varying from seven to fourteen inches, and an average width of fourteen inches to each plough. The engine proceeded across the entire length of the area inside the horse track, being a distance of about two hundred yards, encountering a hard road bed and several large stones, without any diminution in the speed. The power required to perform the same amount of labor was estimated by the ploughman at that of sixteen horses. It was followed by a dense crowd of spectators, who were attracted from all parts of the grounds to witness so novel and interesting an exhibition. Three cheers which made the welkin ring proclaimed the triumph of this noble effort of genius. The crowd were then requested to retire sufficiently to allow the committee to view the operation, when the engine was turned short round and ploughed back to the place of beginning; a right hand plough was then substituted for the left hand one, and the engine traversed the ground a third time, passing close along the edge of the ground previously ploughed. It is proper to remark

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A.D. 1855 . . . . . N° 288.

## Steam Plough.

(This Invention did not proceed to the Great Seal.)

PROVISIONAL SPECIFICATION left by George Tomlinson Bousfield at the Office of the Commissioners of Patents, with his Petition, on the 7th February 1855.—A communication.

I, GEORGE TOMLINSON BOUSFIELD, of SUSSEX PLACE, Loughborough Road, Brixton, in the County of Surrey, do hereby declare the nature of the Invention for "IMPROVEMENTS IN STEAM PLOUGHING MACHINES," a communication from Obed Hussey, to be as follows:—

The improvements in these machines consist of an ordinary locomotive steam boiler resting on three wheels. The driving wheels run on an axle which is fixed permanently to the under side of the boiler crosswise and near the fire box; they turn on the said axle as the machine advances, while the guiding wheel in front is directed either to the right or left, or in a straight line, by means of a screw wheel on the upper end of the spindle, which is operated upon by a screw connected with the steering wheel, in command of the engineer, who stands on the platform. The steam cylinders are fixed to the boiler, one on each side of the chimney, in such a position as to bring the piston rods parallel with the line of the boiler, and a few inches above the line of the top of the boiler, and distant from each other about the diameter of the boiler. The pistons are connected with a double crank, which is

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Provisional Specification.

## Bousfield's Improvements in Steam Ploughing Machines.

operated upon similarly to the operation of the cylinders on locomotive cranks. This crank shaft runs in pedestals on the top of the boiler, nearly over and parallel with the main axle. In addition to the middle bearings in the pedestals, this crank shaft has end bearings on permanent arms, extending from the sides of the boiler, and supported by studs from the main axle. On each end of the crank shaft is a cog pinion, loose on the shaft, and works into corresponding cogs on the internal surface of the rims of the main wheels. These cog pinions are constantly geared into the internal cogs of the main wheels, but are connected and disconnected with the crank at pleasure by clutches operated by a lever. This arrangement for the purpose of turning 10 with facility, as the power may be applied, either to one or other of the wheels, or both.

The guiding wheel in front is supported by strong iron bars, which are fastened to the main axle near the naves of the main wheels, and extend angling to the front end of the boiler, to which they are bolted; thence continued on, and meet two to three feet from the end of the boiler, and are strongly bolted to the socket which holds the spindle of the guide wheel. These iron bars also extend backwards, and bend downwards to a point parallel with the lower back corner of the fire box, thence horizontally and backwards. On these extended ends of the iron bars a platform is built, extending in 20 length parallel with the main axle from outside to outside of the main wheels.

The ploughs are attached to the rear edge of the platform. The ploughs are designed to run parallel with each other, and to fit them for this purpose they are divested of all incumbrance, which prevent ordinary ploughs working 25 well in parallel lines of advance. The ploughs consist of a mould board and land side only; the land side is of a size sufficient only to resist the pressure of the mould board, being full at or near the coulter, and tapering to a point backwards, so that, in ploughing with all the ploughs in a parallel line side by side, one plough shall turn the earth against the back side of the mould board 30 of the adjacent plough; this arrangement is designed for light land. When the nature of the soil will not allow of this position of the ploughs, one end of the platform will be widened.

In place of single ploughs, two distinct ploughs may be made, consisting only of the mould boards and land sides, one a right-handed and one a left-handed plough. These ploughs are fastened together at the upper edges of the two mould boards; this brings the heel of one and the point of the other in the same parallel; thus, when one plough is in the ground with its point forward, the other plough is upward with its point backward. In the exact

Provisional Specification.

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## Bousfield's Improvements in Steam Ploughing Machines.

centre of the whole circumference is a gudgeon, projecting laterally on both sides. These gudgeons hang in an iron frame, which acts as a plough beam. This double plough turns by these gudgeons; first one is in the ground, then the other. By this arrangement the machine will turn the furrows either 5 to the right or the left. Simple catches hold the ploughs in one position; when the catches are tripped, the ploughs roll over by their own action. The ploughs are lifted out of the ground at pleasure by winding up a rope or chain.

LONDON:

Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,  
Printers to the Queen's most Excellent Majesty. 1855.

Obed Hussey applied for an English patent for his steam plow concept but was rejected. To gain a full appreciation for both Hussey's traction engine and Hussey's plow, read his application "communication," which was filed on his behalf by George Tomlinson Bousfield.





Here is an example of Bob's artwork. As we have found no picture of Hussey's steam traction engine, Bob carefully studied Hussey's description in the inventor's petition to London's Office of the Commissioners of Patents and made this illustration. We are not pretending that this is Hussey's traction engine, but Hussey's description points to a machine something like this. There are indications in the historical record that the machine might have been too light for heavy plowing. As Hussey was fresh from two grueling decades of defending his reaper patents (successfully) against repeated court actions by Cyrus H. McCormick, who insisted that his reaper invention predated Hussey's, Hussey decided to be proactive with his traction engine and plow. Hussey turned to his friend Brigadier General Tench Tilghman, whose committee of the Maryland State Agricultural Society published on page 215 in *The American Farmer* in January of 1856 a "Supplement to the Report on Hussey's Locomotive Steam Ploughing Engine" that included these bold assertions: "In submitting their report on this machine, the committee announced their intention to ascertain the result of the attempts which had been made in Europe to invent a locomotive steam ploughing engine, for the purpose of settling the important question of *priority* in an invention which is destined to make an era in the agricultural history of the world." After citing the failures of English attempts, the committee concluded "that the honor of inventing the first successful 'Locomotive Steam Ploughing Engine' belongs to Obed Hussey, of Baltimore, Maryland, in the U. S. of America."

that the engine was exhibited by the inventor merely to show the power of draught and the facility of backing and turning in any direction. The ground had been much trampled during the exhibition, and at one end there was a considerable ascent. The ploughs were all so far apart that each one had to break a separate furrow. The committee ... regard this as the first step in a great revolution in prairie farming, destined by its saving of labor and rapidity of execution, to bring under cultivation the immense extent of land still unsettled in our new States and Territories, many years sooner than could be done in the ordinary way." As some 20,000 spectators were on the grounds that day, the crowd following Hussey's steam plowing exhibition must have been enormous!

Page 162 in *The American Farmer* for

December 1855 explains that Hussey's traction engine was attached to "ploughs picked up on the ground" of the fair because Hussey's plows were not "ready for the occasion." Between the lines (below) are reports on page 58 of Volume 8 (1856) of *The Wisconsin Farmer and Northwestern Cultivator* that were copied from publications in Maine:

It seems, from the subjoined article, which appeared in a late number of the *Portland Advertiser*, and which we copy from the *Maine Farmer*, that plowing by steam has at last proved entirely successful. It may not be extensively used at present, as a means of mellowing the earth but, "wait a little longer" and plowing engineers will take the place of the plow-boys,

and the steam whistle be heard instead of the *whoa haw*.

"A reporter in the *Baltimore Commercial Advertiser*, of Nov. 3, 1855, says: 'After testing the speed of the horses, the track as well as the ring was cleared for a trial of the steam plow. Four large turf plows were attached to it, and it moved off, throwing up furrows each about fourteen inches deep. —The work was well done, and it was the opinion of many farmers present that it was admirably adapted to the breaking up of prairie land. The machine is too heavy for the land in this section of the country, but the principle is a good one, and will lead to improvements which will make the steam plow the means for tilling the soil with profit to the farmer. ...

" 'Awarded to Obed. Hussey for steam plow, the highest premium and a diploma.

"Mr. Hussey, the inventor, is a native of Maine, and formerly resided at Portland.

"He was the first inventor of mowing and reaping machines, and also of several other important inventions.

"From a private letter of Mr. Hussey's to a friend of his in this city, we learn that the power of his latest invention was severely tested, and pronounced completely successful and practicable. He says: 'One farmer declared that forty horses could not have drawn the four plows so deep through such soil at such a rate; another, that it would have required four yoke of oxen to draw one plow; but the committee have kept within bounds in their report, in which they called the draught equal to that of sixteen horses. —The machine steamed out to the show ground a distance of two and a half miles over a road somewhat rough and hilly. It was generally predicted that the experiment would prove an entire failure; but its final success was greeted by the assembled crowd with a hearty enthusiasm and loud and prolonged cheering.' " [*Portland Advertiser*.]

In 1856, Hussey won a silver cup and twenty dollars at the Indiana State Agricultural Fair for a successful demonstration of his steam traction engine and plow. An article in *Illinois Farmer* for the 1st of September in 1856 reported that Hussey took his steam plow from Baltimore to Ohio and that he had written letters to people in Illinois to ask to exhibit it in that state. We do not know how often or precisely where various displays occurred. Page 217 in Volume 2, Number 14, of *Emery's Journal of Agriculture* for September 30th, 1858, reported that "there appeared to have been some defect in the



construction, as it [Hussey's steam plow] was constantly breaking. Each plow required a man to hold it, which is not the case with Fawkes' plows. When we saw it, the axle was broken. In November of 1856, Hussey wrote in substance, that though it had plowed only ten acres, it was in the hands of a man who believed it would yet be perfected—that he found great difficulty in arranging suitable plows to work satisfactorily. Since this trial in Indiana we have heard nothing of Mr. Hussey's invention—have not heard aught of his practical success."

A shrewd businessperson, McCormick hoped to obtain Hussey's patents, and eventually he did acquire them. In 1858, Hussey believed that, despite his dedicated efforts over a lifetime of challenges to his patents while struggling to sell machinery, his reaper business was in decline, and he sold his rights to McCormick. Having survived the Panic of 1837 at the beginning of his career, perhaps Hussey felt that his business could not rebound after the Panic of 1857 near the end of his career.

On the 4th of August in 1860, Hussey perished while on his way to Portland, Maine, to visit his cousin Winslow Hall. The *Portland Advertiser* gives this account of what happened: "Mr. Obed Hussey, of Baltimore, the inventor of the celebrated Hussey reaper and mower, lost his life at Exeter, N. H. [New Hampshire], on Saturday last, by falling between the cars, two of which passed directly over his body, across his abdomen, and killing him instantly. The train usually stops five minutes at Exeter, N. H., for refreshment. Mr. Hussey was on board with his wife, infant child and servant. A child, a stranger to Mr. Hussey, asked for a drink of water, and with that kindness of heart which has always characterized him, he voluntarily went for the water. As he returned the tumbler, the bell rang, the cars then having stopped seven, in place of five minutes, the usual time. The train started but was not going rapidly when Mr. Hussey approached hurriedly and seized the iron rails of the platform at the end of the car, but unfortunately took hold of the rear rail of one car and the front rail of the other. In this position he was, of course, unable to step upon either car, and either intentionally or accidentally let go of one rail, when the momentum of the cars or his own efforts, swung his body round between the cars, and breaking the grasp of his other hand, he fell across the track and the wheels of two passenger cars passed directly over his body. The train was instantly stopped, but life was extinct when his body was reached."

Hussey was 68 years of age. After Hussey's death, many of Hussey's assets were liquidated and the profits transferred to Hussey's widow, whom Hussey had married only five years prior

to the accident that claimed his life. A brother continued his machinery business for a time. (See page 7 in the *New York Tribune* for July 12, 1866.)

We echo the well-chosen words of historian Albert Sidney Bolles, who, on page 40 of his book entitled *Industrial History of the United States* (1878), called Hussey the inventor of "the first really successful and famous American reaper."

On Hussey's grave marker are the words "Inventor of the Mower." So much more could have been inscribed on that stone!

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\**The American Farmer* for September 1855 uses both the American spelling of "plow" and the British spelling of "plough."

#### Acknowledgments

We want to thank author Jack Alexander for his expert assistance in researching Obed Hussey's steam traction engine, Pat Brown of Pat Brown Studios in Hamilton (Ohio) for his excellent photographic reproductions of stereograph cards, Ann Miller Carr for her outstanding genealogical work, author Derek Rayner and Darryl Rayner for their extraordinary kindness in obtaining scans of Hussey's patent communication in England, David Huser for his generous offer to share documents pertaining to the history of Mt. Healthy, Danny Lovell of the W. Frank Steely Library of Northern Kentucky University for his helpful suggestions, Anne B. Shepherd of the Cincinnati Historical Society for her careful research, and sales associate Gregory J. Tassone, Esq., for his good-natured willingness to join us in tramping around the damp hillsides of the Lane farm.

We extend special thanks to Susie Hull, a descendant of Clark Lane, for so graciously going far out of her way to help make our history as accurate as possible and to K. Larry Pyle, a passionate architect who, for many years, has championed the cause of preserving the Lane homestead for posterity. We quickly found that Larry had already been down every path new to us, and, throughout our research, he magnanimously provided document after document, guiding us patiently toward facts and evidence.

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Two brand new Advance engines doubleheading on the sawmill at Rough & Tumble's Threshermen's Reunion. These engines were built in 2014 by the J.S. Company of Middlefield, Ohio and are full size replicas of 6 HP Advance engines.

Photo by Brenda Stant