

THE BUFFALO BIRDSALL

By Brad Vosburg and Robert T. Rhode

From Brad:

One evening while looking through an old *Farm Implement News* of January 1889, I came upon this Birdsall ad. It referred to a Buffalo Birdsall. The engine in the drawing slightly resembled an Auburn Birdsall but did not look like anything I had ever seen before. With the exception of the front axle and auto steering, it looked like an entirely different machine.

Thinking more research was in order, I contacted Bob Rhode for help. Bob replied that he hadn't heard of a Buffalo Birdsall either, but he had found information on the website Vintage Machinery, which quotes a source saying that Edgar M. Birdsall was born in the town of Ledyard, Cayuga County, New York, on June 27, 1837. In 1844, his parents and he moved to Genoa, "where his father engaged in the foundry and machine business with Abram W. Stevens as an associate, continuing the co-partnership until 1860. During that period young Birdsall received his education and also practical experience as a mechanical engineer in the firm's establishment." The source says that the partnership

between Edgar Birdsall's father and Stevens ended and that the father moved the business to Penn Yan in Yates County. Edgar partnered with his father "for a few years." Then the father "sold his interest, and the business was continued by the son and others under the firm name of E. M. Birdsall & Co." In 1881, the business moved to Auburn, New York, and became incorporated as the E. M. Birdsall Company. Vintage Machinery's source continues, "Mr. Birdsall was president of this corporation until 1887, when he voluntarily withdrew and severed all relations with the concern." Edgar moved to Buffalo in 1888, "where he has since resided, being engaged in business as a mechanical engineer and manufacturers' agent."

This background explains why we encounter two different Birdsall companies in two cities. (The one in Auburn continued for many years after a bankruptcy sale in 1905. See *The Threshermen's Review* for December 1905.) The question is whether there were any Buffalo Birdsalls built besides the one in the cut, which has every appearance of having been made from a photograph.

From Bob:

In *The Steam Tractor Encyclopedia*, John F. Spalding and I give this synopsis of the Cooper bevel-gear patent: "C. G. Cooper, Elias' son, and Colonel George Rogers, Elias' son-in-law, assumed partnerships in the firm in 1869. In November of that year, John Cooper retired and the company's name became C & G Cooper & Company. ... Rogers designed a bevel-gear drive familiar to steam buffs and highly touted by Cooper's advertisers. Rogers filed his patent on October 6, 1875, and was granted the patent on February 15, 1876, as number 173,498. Cooper licensed other manufacturers, such as Aultman & Taylor, to employ the bevel gear, or sunflower gear, as it came to be known. The Rogers bevel gear was widely employed for a brief interval in history and greatly advanced traction engineering in the United States. It influenced the writers of Cooper ads to exaggerate Cooper's claim to being the first company to produce a successful traction engine in the United States."

The licensing of the Cooper bevel-gear drive plays an important part in the story

E. M. BIRDSALL'S IMPROVED TRACTION ENGINE.

WE CORDIALLY and respectfully call the attention of threshermen and any others who may be interested in Traction Engines to the following facts; facts absolutely incontrovertible, and facts which will be found to be fully sustained:

It is a fact that the boiler possesses greater steaming qualities, has more tubes, more steam space, and is more durable.

It is a fact that no other engine is provided with so perfect a steering apparatus.

It is a fact that with no other engine can the gearing be disconnected without stopping.

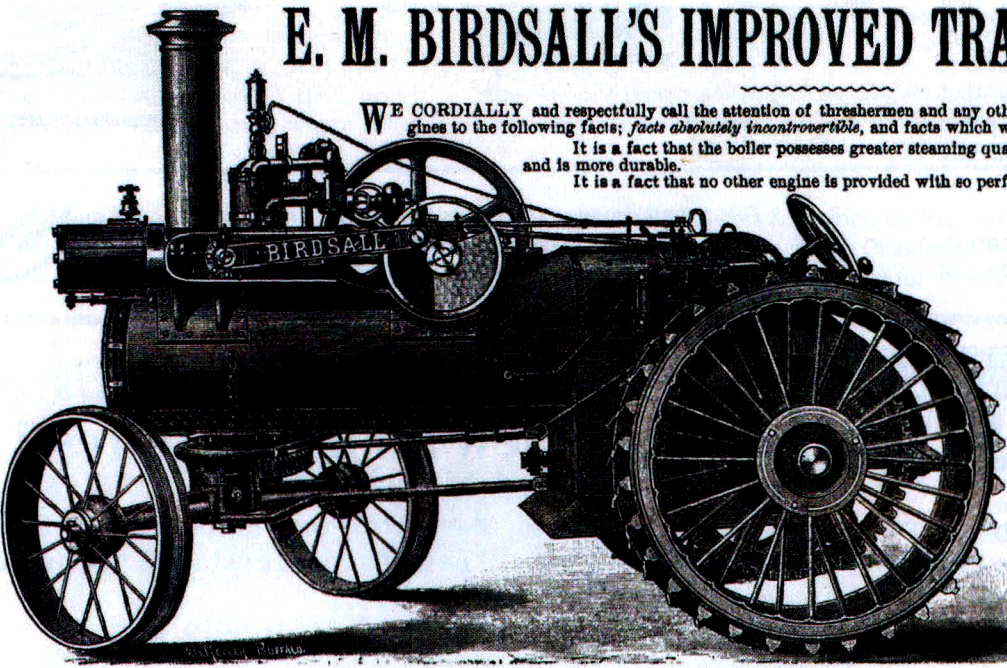
It is a fact that no other engine has a changeable speed which can be operated without obliging the engineer to leave the platform, and use some tool, either a wrench, bar, hammer or some other contrivance.

It is a fact that the mechanism for reversing the engine is far superior to anything ever before produced, acting as a perfect cut-off; and holding all parts firmly in position at any point desired.

It is a fact that this engine is capable of hauling heavier loads than any other possessing same cylinder and boiler capacity, which fact is largely owing to the peculiar construction of the road wheels. These wheels are open-faced, full-deated, wide tread and radially spoked on the principle of what are known as suspension wheels. Agents wanted and correspondence solicited.

Address,
The Birdsall Engine Co.,
BUFFALO, N. Y.

Mention the FARM IMPLEMENT NEWS.



This cut of a Buffalo Birdsall caught Brad Vosburg and Bob Rhode by surprise. See the accompanying story. Brad and Bob invite readers to contribute additional information about this unusual Birdsall steam engine.

of the Birdsall firm. In Number 2 of his series "Development of the Traction Engine in America," published in *The American Thresherman and Farm Power* in October 1916 (available online), Charles M. Giddings wrote, "Following the attempts of C. & G. Cooper Company of Mount Vernon, Ohio, to corner the traction engine business of the country, by buying up all similar patents to the bevel gear drive, a few of the leading portable engine manufacturers secured manufacturer's licenses of the Cooper company under these several patents, among whom were Russell & Company; Owens, Lane & Duyer [sic]; E. M. Birdsall Company; Wood Brothers; Merritt & Kellogg, and a few others."

On October 24, 1882, Edgar M. Birdsall (still in Auburn) received Patent Number 266,243 (available online) for his own bevel-gear drive. He enhanced his device in Patent Number 320,752, which was issued on June 23, 1885. As the patent term was seventeen years, the Rogers patent of 1876 was still in force, and we can assume that Birdsall's invention had differences sufficient to merit its own patents. In our encyclopedia, John Spalding and I offer these sentences: "By 1881, Birdsall and Company had outgrown its quarters. As Geoffrey Stein indicated, in September of that year, it moved to the Cayuga Chief Company's former plant in Auburn. Birdsall produced its first traction engine after the move." Questions arise. During its first year of engine production, did Birdsall build engines having a bevel-gear drive that more closely resembled that of Cooper? Did the "several patents" of Cooper include one so similar to that of Birdsall that Birdsall felt constrained to pay Cooper a licensing fee? Or did Giddings mistakenly believe that Birdsall paid Cooper a licensing fee?

On November 19, 1889, Birdsall (now in Buffalo) received Patent Number 415,438

for the crosshead and connecting rod arrangement and Patent Number 415,439 for the bevel-gear drive of his newly designed Buffalo engine. Such efforts to secure patents suggest that Birdsall had every intention of producing many of the Buffalo Birdsalls. Even so, I have not run across a historical photograph of the Birdsall engine that Edgar planned to manufacture in Buffalo.

Description of the Buffalo Birdsall from *Farm Implement News* of January 1889:

The Improved Birdsall Traction Engine

The accompanying cut represents a traction engine designed by Mr. E. M. Birdsall (late of the Birdsall Company, of Auburn, N. Y.), manufactured by the Birdsall Engine Company, of Buffalo, N. Y., and claimed by

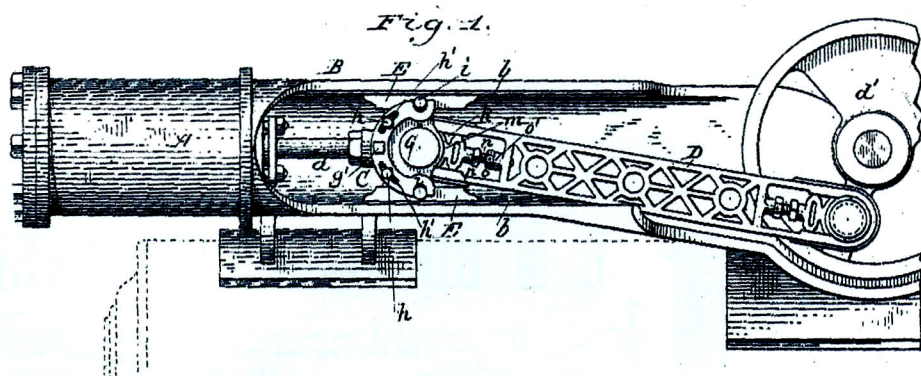
the manufacturers to possess more points of actual merit than any of its class now on the market. Engines of this class from the time of their first introduction have proved to be so servicable in operating threshers, saw mills, hay presses, and all other classes of machinery, which are required to be moved from place to place, as to almost supersede the plain portable engines, which had to be hauled about the country, as well as the machinery for which they furnished the power. Experience in their use, however, has necessarily demonstrated their faults, and it has been the purpose in designing this engine, to overcome such faults as were clearly owing to complicated construction, and disproportion and quality of material used, by substituting more simple and effective devices, and at the same time to add strength and durability. Convenience of handling is also another

(No Model.)

**E. M. BIRDSALL.
STEAM ENGINE.**

No. 415,438.

Patented Nov. 19, 1889.



This patent drawing represents the Buffalo Birdsall's crosshead and connecting rod arrangement.

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essential feature, and has been so admirably provided for, in the construction of this engine, as to enable the engineer to handle and control every part without leaving the platform. For instance: The gearing which transmits the power of the engine to the road wheels can be connected or disconnected by the engineer, without leaving the platform, by the use of a simple lever. Also the gearing is so constructed as to provide a *fast* and *slow* speed, either of which can be used at the option of the engineer, while remaining in his place on the platform.

The cylinder drip cocks, and the draft blower, are also operated from the platform. The control and supply of steam from either end of boiler to the cylinder is more simple and effective. The arrangement for reversing the engine is decidedly superior, for the reason that the operating parts are so constructed as to *rigidly* and *substantially* hold the excentric at *any point* desired, thus making it a *perfect adjustable* cut-off. The entire weight of engine and boiler is supported at both ends on springs, which protect every part from any derangement incident to traveling over rough roads. The old styles of chain connections for steering the engine have been discarded, and a segmental screw gear substituted, which gives quick and easy control and does away with the "see-saw" jerking movement, giving steady action to the front axle, even on rough ground. The *drive* or *road-wheel* presents features of strength and *grip*, or *traction force*, which no other wheel possesses. The peculiar construction of the open *faces* or *tread* adapts it to any condition of roads, whereby the engine is enabled to haul heavy loads in deep mud or sand, where other

styles of wheels would fail to even move the weight of the engine itself. All of the essentials which go to make up a first-class traction engine are thoroughly embodied in the construction of this engine, and the result must be conceded to a marked improvement. By addressing the Birdsall Engine Company, of Buffalo, N. Y., fuller information can be obtained.

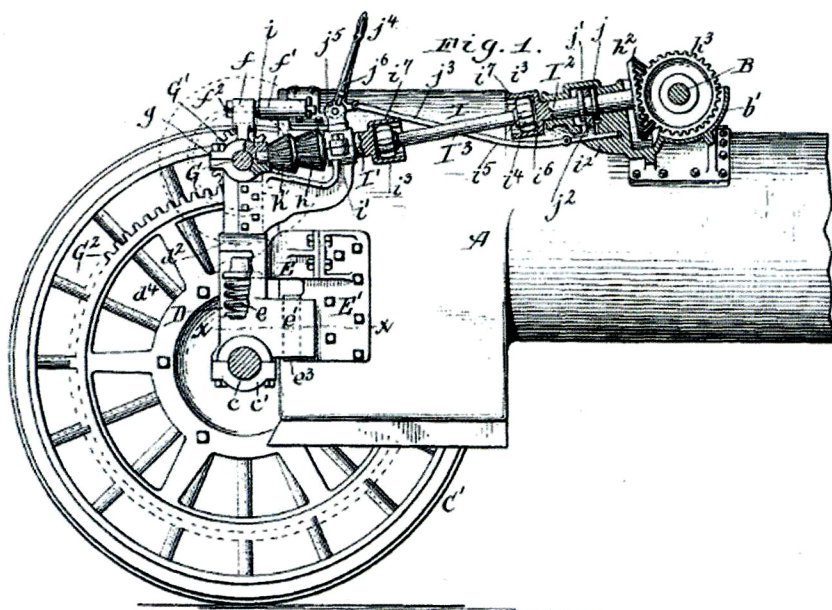
(No Model.)

E. M. BIRDSALL.
TRACTION ENGINE.

No. 415,439.

3 Sheets—Sheet 1.

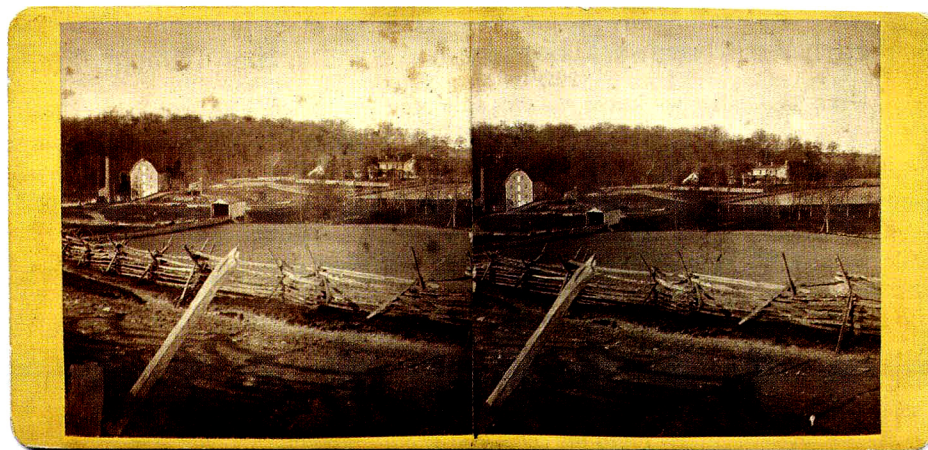
Patented Nov. 19, 1889.



Here we see a patent drawing of the Buffalo Birdsall's bevel-gear drive, a familiar feature of Birdsall engines over the years but with enhancements that Edgar Birdsall added in Buffalo.

Correction

In the Oct/Nov issue of *Engineers & Engines*, we inadvertently omitted the caption for one of the photos in the article on Obed Hussey and His Ohio Test of the First Successful Reaper. We are reprinting the photo with the caption below. We apologize for the error. Submitted by Robert T. Rhode.



(Left): 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