# Traction Engines

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The early history of the traction engine goes back to the very earliest history of the steam engine itself. We find that James Watt's attention was called to the possibility of a steam driven carriage in 1759. He included the locomotive engine in his patent of 1784 and the same year his assistant, Murdock, made a working model of a locomotive. As early as 1769, a Frenchman, Cugnot, made a three-wheeled, two-cylinder steam carriage which carried four passengers and attained a speed of 2¼ miles per hour. However, it capsized one day in the streets of Paris, which incident led to the imprisonment of the inventor and stopped further trials.

The first record we have of a steam-driven vehicle in America is the patent issued to Nathan Reed in 1790. About the beginning of the nineteenth century, Oliver Evans completed a flat bottomed boat to be used around the Philadelphia docks and mounting it upon wheels propelled it by its own steam engine to the river. This is the first record we have of the building of a traction engine in America. However, Evans was evidently impressed with its possibilities, for he asserted that carriages propelled by steam would soon be in common use, and offered a wager of three hundred dollars that he could build a "steam wagon" that would travel faster than any horse that could be matched against it. This perhaps speaks more for Mr. Evans' sporting blood than for his mechanical judgment, for although his statement has been proved correct during the present automobile age, it would doubtless have troubled the gentleman considerably to have produced one in his day.

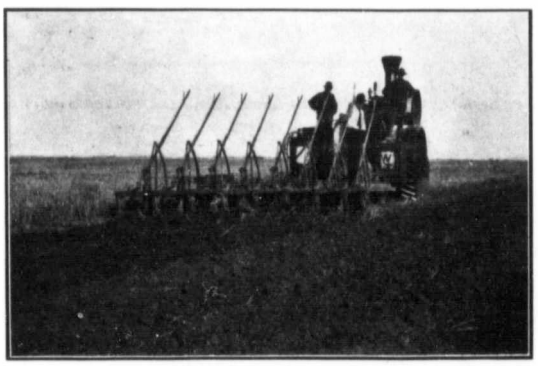
About 1830, when the common roads had been considerably improved in England and when railroads were being opened in several places, the idea of the introduction of steam carriages on common highways became popular with inventors. During the following three or four years several steam carriages were built and put in operation in and around London. Some of these made regular trips carrying passengers, and reached speeds as high as ten miles an hour. At one time the successful introduction of road locomotives seemed to be almost an accomplished fact in England. Finally, however, further development was discouraged by opposing legislation and perhaps also by the fact that steam railroads were making rapid progress, for up to this time the designers and builders of traction engines had in mind the passenger traffic. In America the roughness of the roads was an additional obstacle of importance.

But few traction engines were built during the period from 1840 to 1875, altho the patents issued during this time include several devices which are generally supposed to have been first proposed at a much later date. Among these is the "caterpillar" wheel (1856); the four-wheel drive (1857); the traction wheel with spikes which may be withdrawn (about 1859); and the double-undermounted engine (1868).

About 1876, when portable engines were used to quite an extent for power for threshing machines, it became apparent that it was only logical that these engines should propel themselves and also perhaps pull the threshing machine from place to place. The manufacture of traction engines was then begun in earnest and in 1880 we find about ten firms engaged in their manufacture, about eighty per cent. of which are still in the business.

A Goold, Shapely and Muir Gas Tractor pulling a 5 bottom 14-inch Cockshutt Engine Gang in Manitoba Gumbo.

Originally, no sharp distinction was drawn between the traction engine and the self-propelled passenger vehicle. The idea of the latter was again taken up in the later eighties, but since then development along this line, resulting in the present automobile, has been entirely aside from the development of what is now known as the traction engine.



A Moline Engine Gang doing some nice work in stubble.

It is not the writer's intention to dwell upon the history, and this has been touched upon merely that we may better appreciate the present stage of development and possibly obtain some idea along which lines of improvement may be expected. We shall perhaps arrive at this most directly by considering for a moment the engine we would have if all of the desirable features were combined in one; if we met all conditions in the best possible way; if we had, in short, an ideal traction engine. These features might be something as follows:

1st. In the ideal traction engine the fuel cost must be low, and the fuel should be easily obtainable at any time in the local market.

2nd. The ideal traction engine must be simple and reliable—that is, it must be always capable of delivering the required power.

3rd. The ideal traction engine must be durable, for maintenance and depreciation must be counted in the cost of power delivered.

4th. The ideal traction engine would be safe against the danger of injury to life and property from explosion or fire.

5th. The ideal traction engine would be able to drive over anything in the way of roads or ground that it would meeet. It would be able to negotiate steep hills, sand, soft ground, sloughs, wet clay, mud, snow, ice., and also travel on pavements without injuring them. It would have wheels that could not slip on any surface and the engine would always be able to furnish whatever power was required to turn them.

6th. The ideal traction engine would be well balanced and would run steadily; that is, it would be able to maintain a constant speed whether running empty or under full load. This is necessary because the separators and some other machinery which it is required to drive can only do good work when run at an unvarying speed.

7th. The ideal traction engine would require only such attention from the operator as would be required to make it conform to the requirements. It would be easily steered and would turn as short as desired.

8th. The ideal traction engine for all localities should not require a great amount of water, for although this is usually plentiful, there are localities where it costs considerable to furnish it, and this cost must be counted in the cost of power delivered.

9th. In the ideal traction engine the cost of lubricants and miscellaneous supplies would be low.

10th. The ideal traction engine would be noiseless in operation.

11th. The ideal traction engine would be simple in construction so that anyone could easily learn to operate it.

12th. The ideal traction engine would be constructed so that the operator could easily manipulate it, and be protected from dust and weather.

When several manufacturers build a machine for a certain purpose year after year, they are obliged, to a great extent, to follow the demands of the purchasers and operators, who are naturally most intimately affected by the state of perfection of the machine. It is, in short, in the end simply a matter of the "survival of the fittest". We have many examples in farm machinery, in which the accepted type has become well established. It may then be fairly assumed that the most popular type—the one which, other things being equal, sells in the greatest numbers—is the nearest to the perfect or ideal.

There is still considerable variation in the design of traction engines built by the different manufacturers, but in the case of the steam traction we may now begin to see some tendency toward a common type. The internal-combustion tractions, on the other hand, being of more recent origin, naturally show greater variation in design and construction.

To-day most of the leading builders of both steam and gasoline engines mount the engine on four wheels, the rear two of which are the drive or traction wheels, while the front ones are used to steer the engine. In a few cases a single front wheel is used. The weight is usually distributed so that from two-thirds to three-quarters of it is carried by the traction wheels. A certain amount of weight is neces-