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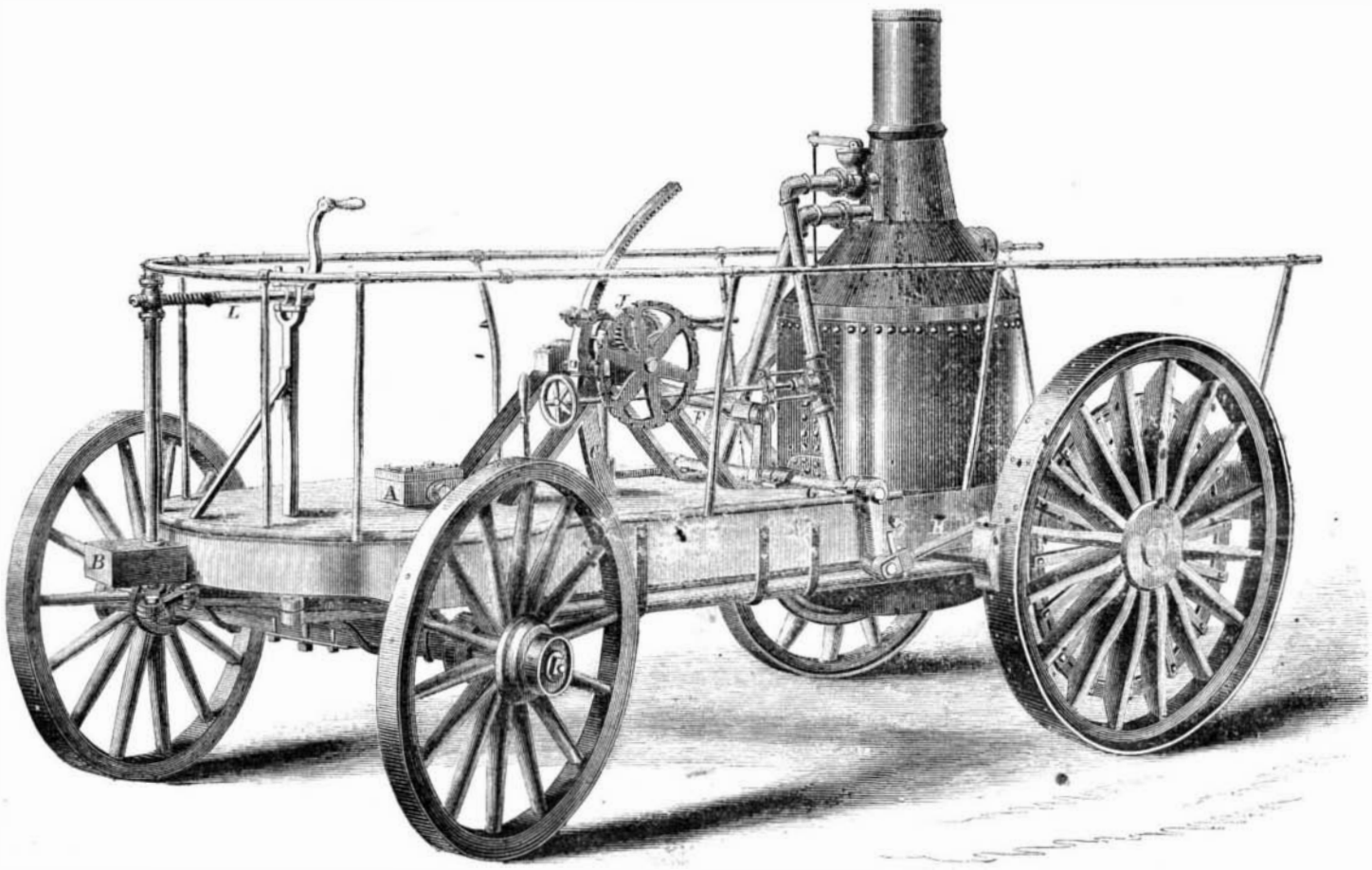
Improved Steam Carriage.

The ingenuity of inventors and engineers has, for many years, been directed to perfecting the steam carriage so as to adapt it for traffic on common roads, and thus open another field for usefulness to the steam engine. In years gone by steam carriages ran on common roads in England, and some were in operation for months, carrying passengers between different points with regularity. From various causes, the chief one being unpopularity, they were discontinued, and we believe there are none now at work in the United Kingdom except traction engines for hauling heavy timbers in shipyards, or carrying loads on highways for short distances. In France, we learn by recent foreign advices, that a line of steam carriages has been established between two provincial towns, but no particulars are given of the engines or their details.

In this country the steam carriage has been the subject of much thought, and many valuable improvements have been made in it. Among the later machines may be classed the self-propelling steam fire engines of Lee & Larned, and Latta, of Cincinnati. One of Lee & Larned's engines is occasionally in use as a steam fire engine in this city; several of them were built years ago, but the *John Storm* is the only one now in existence; the others were torn to pieces after short service. Mr. Richard Dudgeon, of 24 Columbia street, New York, an accomplished machinist, built a steam carriage which ran publicly in this city on several occasions. It was destroyed by fire in the Crystal Palace. Mr. S. H. Roper, of Boston, has lately built a steam carriage which weighs but 450 pounds. These are not the only ones ever constructed here; we might mention many ambitious attempts which failed, but we think further mention of them unnecessary at this time.

Mr. Perry Dickson, of Erie, Pa., has recently invented a steam carriage for common roads that can also be instantly converted into a stationary engine without disconnecting any part whatever. We give very full illustrations of it, both in perspective and in detail.

The perspective view represents a machine which was constructed the past winter and is now in successful operation. In Fig. 1 the details are shown. The distinguishing feature of this engine is the arrangement for graduating the power of the engine to the work to be done, so that heavy grades, or stiff miry ground, can be ascended or run over with ease. The arrangement of the machine to effect this is shown in Fig. 1, and consists in applying the power of the engine nearer to or further from the axle, and in this way exerting greater force upon the wheels when unusual obstacles oppose them. This alteration can be made at any time while the engine is in operation. There is another novelty in the way the power is transmitted to the driving wheels. This consists in a toggle-joint movement, so arranged that one arm bites on the inner face of a metallic wheel bolted to the driver—thus dispensing with a crank and allowing the engine to work freely in all positions or inequalities of the ground; it also allows the side levers to make a short or long stroke.



DICKSON'S STEAM CARRIAGE.

Mr. Dickson has shown a good deal of ingenuity and originality in his ideas and in putting them in practical form; following is a description of this machine.

In the engraving, Fig. 1, the cylinder, A, is attached to the main frame, B, and oscillates thereon. The piston rod connects to a quadrant, C, which has centers or bearings at D, so that when the engine is in motion the quadrant will have a rocking movement to and fro. On this quadrant there is a sliding head, E, to which the connecting rod, F, is jointed. This latter rod gives motion to a transverse rock shaft, from which the main rods, H, run to the driving wheels, as before explained.

The connecting rod, F, is jointed, and has a forked end, which enables it to embrace the link, and the sliding head is furnished with a rack, I, through which the head is raised up or lowered down on the quadrant; suitable means are provided to retain the sliding head, E, in its working position wherever it may be placed. Fig. 4 is a front view of the quadrant, showing the method by which it is operated; that is, through the wheels, J. There is a small fly-wheel, K, attached to the frame, which serves to steady the motion of the engine and operate the valves thereof; it is also a driving pulley to run any kind of machinery independent of the carriage, if it is ever needed. By these arrangements—that is, the sliding link for regulating the amount of power to be transmitted to the driving wheels, and the substitution of the toggle-jointed arm acting on the driving wheels for the crank motion, it is possible to use one cylinder in-

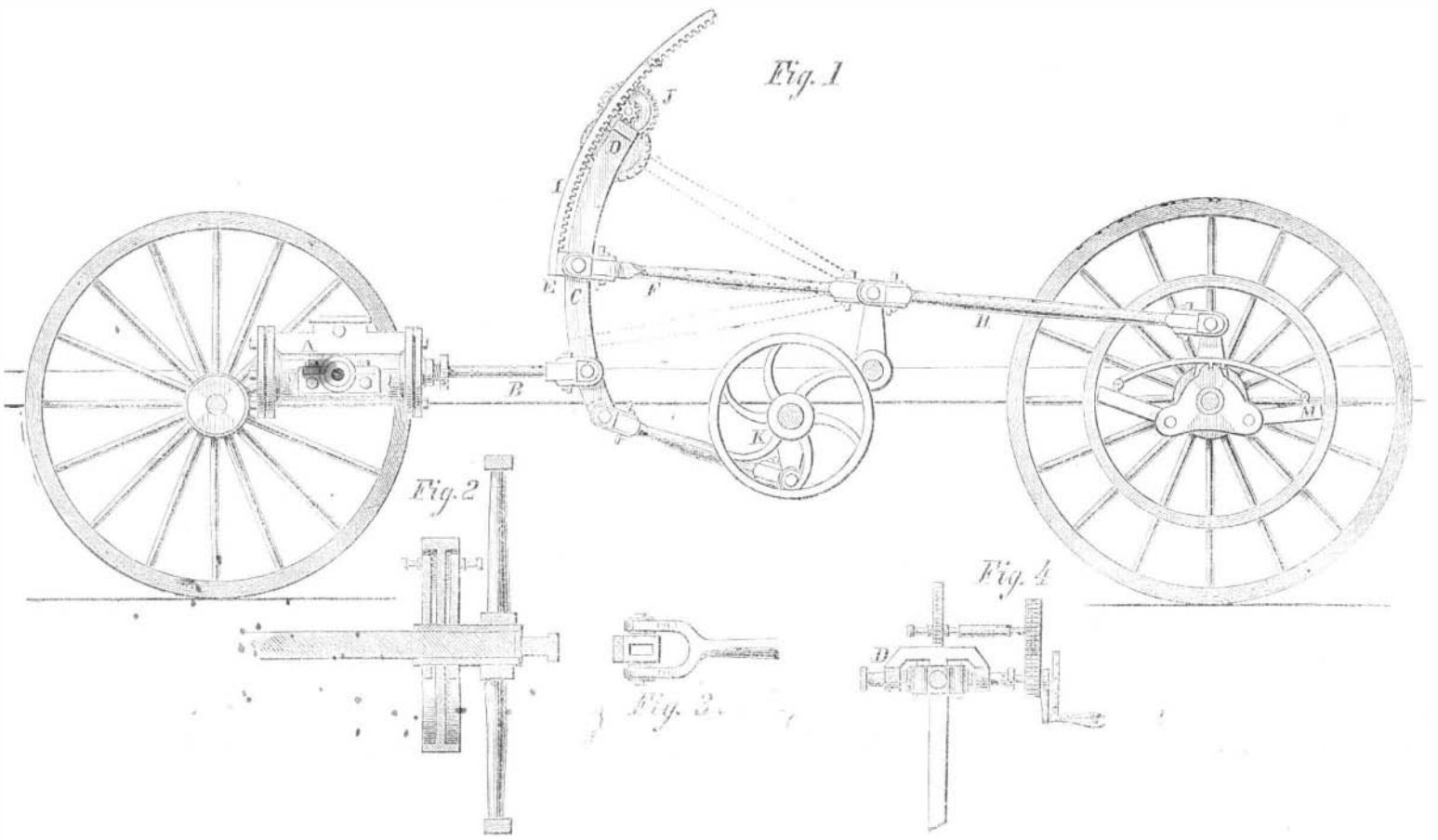
stead of two, thus simplifying the apparatus, reducing the weight, and enabling the machine to be started at any time, for there are no dead centers to overcome, and the motion is easy and continuous. The machine is capable of going in any direction, either backward or forward, by throwing either set of the toggle-jointed arms, M, in or out, and it is steered in front by gear, L, there placed. When the sliding head is moved up until it is in line with the rock shaft it is then at the point of no motion, but the engine yet runs while the carriage stands still. In this way the power may be used for driving pumps or other machinery of any kind whatsoever, and this without disconnecting any rod.

tion of time. In different places I work it with a short stroke, and then it runs and continues to run with perfect safety, whereas, if it were the *John Storms*, or an engine that had to make a full stroke or nothing, then I must let on steam until it *started*. As soon as it started it would have too much steam on and would go smash into some catastrophe before it could be stopped. The rotary motion of the driving wheels is perfect, and there is no need of two engines for such a purpose. I can get more accommodation out of one simple lever than there would be in all the cog wheels that an English traction engine would be able to haul."

This carriage was patented November 25, 1862, by

practice and school ship for naval apprentices, under the command of Lieutenant-Commander R. B. Lowry, U. S. N., who was specially selected by the Navy Department for the very important and arduous duty of organizing and establishing on a firm basis the nucleus from which the future rank and file of the navy were to emanate, and in such a form as not only to be reliable at all times, but of a character which would place our vessels upon an equality, if not make them superior, to those of any naval power.

Owing to the want of proper attention on the part of some recruiting officers, and the desire of many parents to place their boys in the service, either in hopes of receiving part of their pay or for the pur-



ELEVATION OF STEAM CARRIAGE.

The inventor has some ideas of his own on this subject which we take pleasure in printing as he has written them. He says:—

"Suppose my machine in the same depot with the *John Storms*, when the fire-bell rings and "Barnum's" is on fire. So soon as I get five lbs. of steam I can start and run slowly; by the time I get opposite your office [twenty rods from the depot.—EDS.] I have ten lbs. of steam, and have turned my hand crank and increased the speed two to one. As soon as the steam is high enough for more speed I keep turning the crank and lengthening the stroke, and thus get to the fire as early as any horse-drawn engine. And further, I can get there and have hose all attached by the time my steam is sufficient to throw water, and I have spent no time connecting or disconnecting anything except the hose.

"Let us go back and look after the *John Storms*, which has had to stay at the depot until it is smoking hot; it must have a pressure of steam sufficient to go a whole length stroke, or none, before it can start, and, after it gets to the fire, it must be taken apart and put together again to make a stationary engine of it, during which time poor "Barnum" might get badly burned.

"Some people propose to build three engines to accomplish the object of one fire engine; to do this the engines would weigh twelve tuns. Such an engine would destroy so much pavement that if there was a fire the people in the neighborhood would keep still about it, for fear the engine would come.

"My engine is eight-horse power, weighing fifty-three hundred—which is some ten hundred more than is necessary, it being the first one ever made on my plans. I have ascended grades of one foot in four, and find that climbing steep grades is only a ques-

Perry Dickson; for further information address him at Erie, Pa.

OUR NAVAL APPRENTICE SYSTEM.

The need of a naval apprentice system which had been once tried in our service and failed, owing to a variety of causes, made itself apparent at the commencement of the rebellion. The scarcity of naval seamen, men who were conversant with the routine and duties of men-of-war, gave the department much anxiety and caused considerable delay in fitting out vessels for the pressing and important demands of that time. It had been supposed that the fishermen, to whom the Government has been paying large bounties for many years, would come forward in the event of war and pay back these munificent gifts which they had been receiving. In this the department were disappointed.

The navies of other powers have their apprentice and training schools, and England especially is noted for her wisdom and foresight in the education of boys for service on board war vessels. In this country the system has at times been ridiculed, although some of our best naval officers have approved the plan, while others have objected to it mainly on the ground that at its organization they would be subjected to the arduous work of bringing it to perfection, forgetting that in these apprentices who, having once become thoroughly instructed in seamanship and naval gunnery, would in the course of a few years become the bone and sinew of our naval strength and pride.

Our apprentice system was formally inaugurated by an act of Congress dated March 2, 1837, but after many disappointments it was abandoned in 1843, and was not revived until 1864. In May of last year the *Sabine* was ordered to be put in commission as a

pose of ridding themselves of troublesome, incorrigible or refractory sons, a large number of worthless, and, in some instances, vicious boys were sent on board. Many persons seemed to think that this was a school of reform for bad boys, and availed themselves of the privilege of confining their wicked offspring in a man-of-war at the expense of the Government. Nothing could have been more foreign to the plan of the Navy Department than the enlistment of such a class of boys, and upon the proper representations the naval rendezvous ceased to take any more boys, and the enlistment was only consummated on board the school ship.

The mistake of careless enlistments was speedily rectified. Under the present system of careful scrutiny and care which is exercised in the preliminary examination, it is almost impossible for any bad boy to obtain admittance into this interesting and promising body of embryo naval seamen. The greatest care is taken in the selection of boys. They must be 14 and not over 18 years of age. At 14 they must measure not less than four feet eight inches in hight and 27 inches around the chest, and at 15 years the hight must be four feet ten inches and 29 inches around the chest. Each candidate must be able to read, write and spell, be free from physical disabilities, well grown, healthy, active, and exhibit an aptitude for the ocean and the duties of sea life.

To guard against bad characters, the candidate must be of good moral standing, not an indentured apprentice, must never have been charged or convicted of crime. He must be a willing applicant, and must have the written consent of his parent or guardian. Parents can rest assured that applicants will be compelled to undergo a thorough examination as to their moral and physical qualifications. It