# Science and Art.

### Trial of Steam Plows.

MESSRS. EDITORS—The trial of steam plows before the Executive Committee of the Illinois State Agricultural Society, took place at Decatur on the 10th inst. The weather was cold; rain and snow combined rendering the ground wet, soft, and slippery. The arrangements for the trial were not as complete as could have been desired, and the unfavorable weather and condition of the ground made the trial one of but partial success. On wet, soft grass land the plow did well, but it soon became too wet and slippery even there; on stubble land the plows, having no coulter, choked. The only plow exhibited was that of Mr. Fawkes, of Pennsylvania. It was provided with an upright locomotive boiler, having 151 flues set upon a long frame-work, which rested on a large roller-shaped driving wheel behind, and two guide wheels in front. A tank and box for wood or coal rested over the driving wheel. The guide wheels are in advance of the boiler. The engine is of 20-horse power, with 8-inch cylinders driving the master wheel by cogs on the ends of the roller. The driving wheel is shaped like a barrel, being six feet long and five feet high. The mode of moving this enables the inventor to stop his machine at once without any danger of breaking anything. The guide wheels are about eighteen inches wide, and three feet high, turned by a wheel under the control of the engineer. The tank, smaller than intended, holds five barrels of water. Mr. Fawkes estimates the consumption of wood at one cord per day, and of water at one and a half barrels per hour. The weight is loaded about seven tuns; cost $2,500. Cost of a ten-horse power, $1,500. The plows are on frame-work behind, capable of being lowered and raised by an assistant.

The machine drew six plows, cutting 12-inch furrows, between four and five inches deep. It plowed at the rate of one acre in forty minutes, [illegible] ground it could go faster. On very wet ground the driving wheel slipped, which the inventor thinks he can obviate by putting spuds in it. The success was beyond expectation; and as there are several other steam plows in course of invention and erection, it is to be presumed that Yankee enterprise and ingenuity will soon put forth a steam plow that will surmount all obstacles to its success.

H. HINCKLEY.

Prairie Cottage, Ill., Nov., 1858.

### Steam on the Canals.

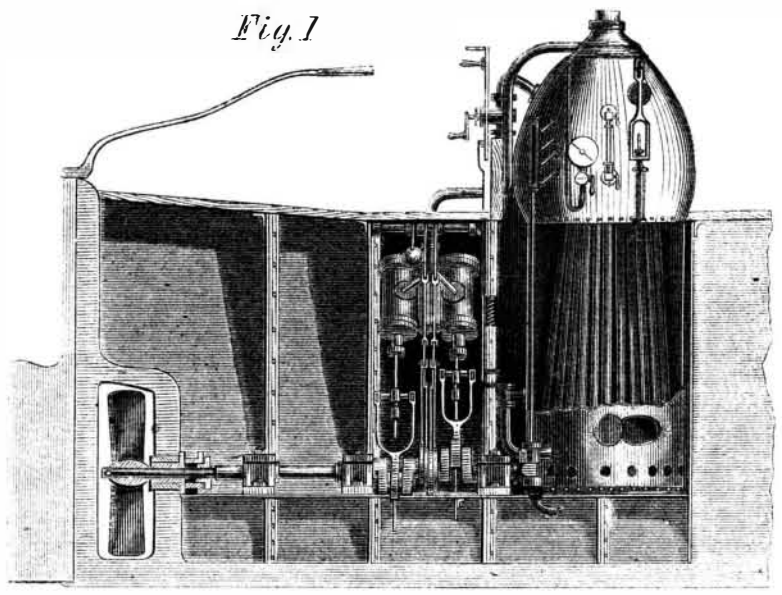
This question has lately engaged much public attention in this and other cities in the State of New York, and most of our cotemporaries have treated it as being entirely novel. We are glad to witness an awakening of the community to a sense of its importance, after years of our admonition regarding its necessity and practibility. In 1849, on page 76, volume VII., SCIENTIFIC AMERICAN, we urged the expediency of using steam power on the Erie and other canals, and at last we have beheld the application in 1858, carried out successfully.

Three steam propellers have made the trip from Lake Erie to this city, and we recently examined one of these—the *S. B. Ruggles*—a first class canal boat, double-decker, with engines built by David Bell, of Buffalo. They are similar to those which are favorites on the Upper Lakes, and are of good workmanship. The cylinders are suspended, 14×14 inches, working downwards, and yoked at right angles direct to the propeller shaft. The screw is 5½ feet in diameter, and the pitch 7 feet. She ran at the rate of from 3 to 4½ knots per hour, and consumed three tuns of coal in twenty-four hours; her cargo consisted of 5,000 bushels of corn, and hauled another boat with a similar cargo. This was very good for a first trip, with new machinery.

During the next two years some hundreds of steam engines will be required for this canal, and the most suitable in all respects for such a purpose is an important consideration. We believe that it will be found more convenient and more economical for each boat to be a self-propeller, and not to act as a tug, like those which have been built; small, efficient and compact engines are required to fulfill such conditions, and we therefore present an illustration of well-tried engines embracing such features.

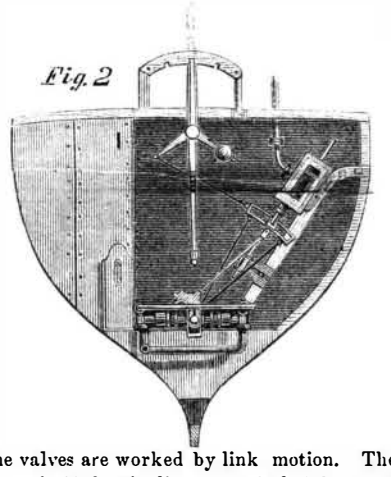
Fig. 1 is a longitudinal section, and Fig. 2 a transverse view behind the boiler. They belong to the boat *Thomas*, which has been running two years on the Forth and Clyde

*Fig. 1*



Canal, Scotland, and have been described in the Transactions of the Society of Engineers. The vessel is of iron and 120 tuns burden; the boiler is three feet in diameter, 7 feet 3 inches high from furnace; has 54 brass tubes 3 feet 5 inches long and tapered (a peculiarity) from 2¼ to 1¾ inches from the fire-box to the top. The entire heating surface of boiler is 110 square feet; the cylinders are bolted together on the bilge, with the steam box between; their bore 6¼ inches, stroke 10, and

*Fig. 2*



the valves are worked by link motion. The screw is 3½ feet in diameter, pitch 4 feet, and the whole weight of boiler, engines and screw is only 2½ tuns; the revolutions of shaft 130 per minute, speed five miles per hour, with 36 pounds pressure; coal used one tun per 100 miles. The entire cost of machinery is only $750. This boiler is applicable to any of our canal boats, and is capable of generating sufficient steam for two engines of 9 inch bore, and 15 inches stroke. The coal bunkers are on the opposite side of the engines, and the whole space occupied is only a few feet. The economy of this boiler and engines will contrast very favorably with any of those which have been built for our canals; and the saving of expense over horse-power previously used has been a third of the whole. As we learn that a great number of wild projects are proposed to be carried out this winter in Western New York, for the steam canal navigation of 1859, we present the above as worthy of much attention.

NEW BLACKING.—That ubiquitous individual, I. S. Clough, of 231 Pearl st., New York, has added another article to his already diverse collection of Yankee notions; it is the "Excelsior Vegetable Star Blacking," manufactured by A. Randell & Co., of this city. Mr. Clough assures us that it has been pronounced the best, "even by Members of Congress." There's praise!

### Williams' Quartz Mill.

The number of mines which have yet to be worked and made available, renders every contribution to mining machinery and improved appliances for rendering useful the mineral contents of the earth valuable to the community, and our readers who are engaged in such operations will read with interest the following description of a quartz mill invented by L. W. Williams, of Nevada City, Cal., and patented by him April 20th, 1858.

*Fig. 1*

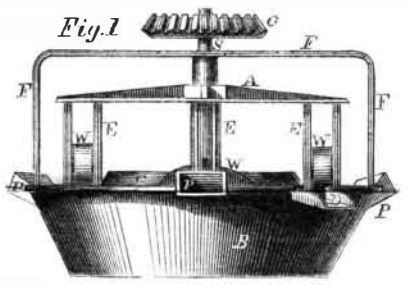



*Fig. 2*

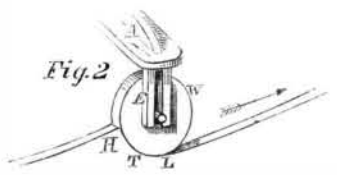



Fig. 1 is a perspective view of the machine, in which B is a circular battery, in whose center is the upright shaft, S, supported by the frame, F. O is a bevel wheel, and A is a cross, hung through its center upon the shaft, S, and to which are attached the slotted arms, E, that embrace and support the wheel, W. The axis of these wheels being placed within the slots in the arms in such manner as to permit the wheels being raised perpendicularly—the slots in the arms embracing the journals of the wheels, W, and operating as guides, whereby the wheels are kept in their places. C is the inner circle of the battery, B, and forms a support for shaft S. The distance of the inner from the outer circle at the bottom of the battery is but little more than the breadth of the face of the wheels, W. At the top, the space between them is sufficient to allow the wheels, together with their arms, to revolve without touching. P are ports for feeding the machine. D is the discharge, through which the quartz, after being reduced to sufficient fineness, escapes in the form of muddy water. A stream of water is constantly entering the bottom at some point, and flowing out at D.

Fig. 2 is a section of the inside bottom, T, over which the wheels, W, move, and by whose means they are alternately raised and let loose. L is the common base at which the inclines commence, H, the highest point of elevation to which the inclines are produced, being somewhat less than the radius of the wheels, W. The form of the drop-off from H to L is a segment of the circumference of the wheels, W.

When this machine is in operation, and the wheel, W, has arrived at the point, H, and begins to fall, it must move forward in the direction of the arrows a distance equal to one-half its diameter before it has fallen the distance from H to L; therefore, if this machine is made to revolve to the same speed with which a free body would fall in space a distance equal to that which the wheel falls, then the blow produced by the fall of the wheel, W, would be the same as if it were raised, and let fall, when the machine was at rest, and the wheel in the position shown in Fig. 2. The wheels, W, are made of such size in relation to the surface they travel over in a revolution of the machine, that the wear from stamping is brought a short distance further back at each revolution, thus keeping them equally worn; and if the wheels tend to wear more upon the outside edge than the inside, they can be reversed, and the outside edge placed upon the inside. The inside bottom or track, consisting of the inclines, T, may be cast in sections, and laid in a battery in such manner that when worn they can be easily removed, and replaced by others. When crushing with this mill, quicksilver is placed in each of the drops in the track, and the process of amalgamating carried on, all gold liberated remaining in the machine.

The inventor will be happy to furnish any additional particulars on being addressed as above.

### New Gearing.

This invention is designed to supersede the ordinary cog or tooth gearing, and consists in having spiral ledges or threads formed on one wheel, and made to gear or work into corresponding grooves in its fellow. The inventor is E. A. Goodes, of Philadelphia, Pa., and it was patented this week.