Science and Art.

Notes on the Progress of the Paddle and Screw.—No. 2.

It appears that Denis Papin, in 1690, first proposed to use steam to work paddle-wheels. A rack-work was moved by pistons descending in steam cylinders by atmospheric pressure. Savery, in 1702, scarcely ventured with timidity to suggest the use of his steam engine for the purpose, but it is asserted in a French work that Papin, in 1707, actually propelled a vessel on the Fulda by Savery's engine.

The first patent relating to a steamboat is that of Jonathan Hulls, in 1736. He placed a paddle-wheel on beams projecting over the stern, and it was turned by an atmospheric steam engine, acting in conjunction with a counterpoise weight, upon a system of ropes and grooved wheels.

The Comte d'Auxiron and M. Perrier are stated to have used a paddle-wheel steamboat in 1774, but the notices of these and of other early experiments are very vague, not contemporaneous, or on doubtful authority. Desblancs, in 1782, sent a model to the Conservatoire (still there) of a vessel in which an endless chain of floats is turned by a horizontal steam engine.

The first notice I can find of a successful trial of the steamboat recorded by witnesses, is in a notarial certificate, which I lately inspected in Paris. This asserts that in July, 1783, the Comte de Jouffroy caused a vessel of 130 feet in length to be propelled for a quarter of an hour by a steam engine upon the Saone, near Lyons.

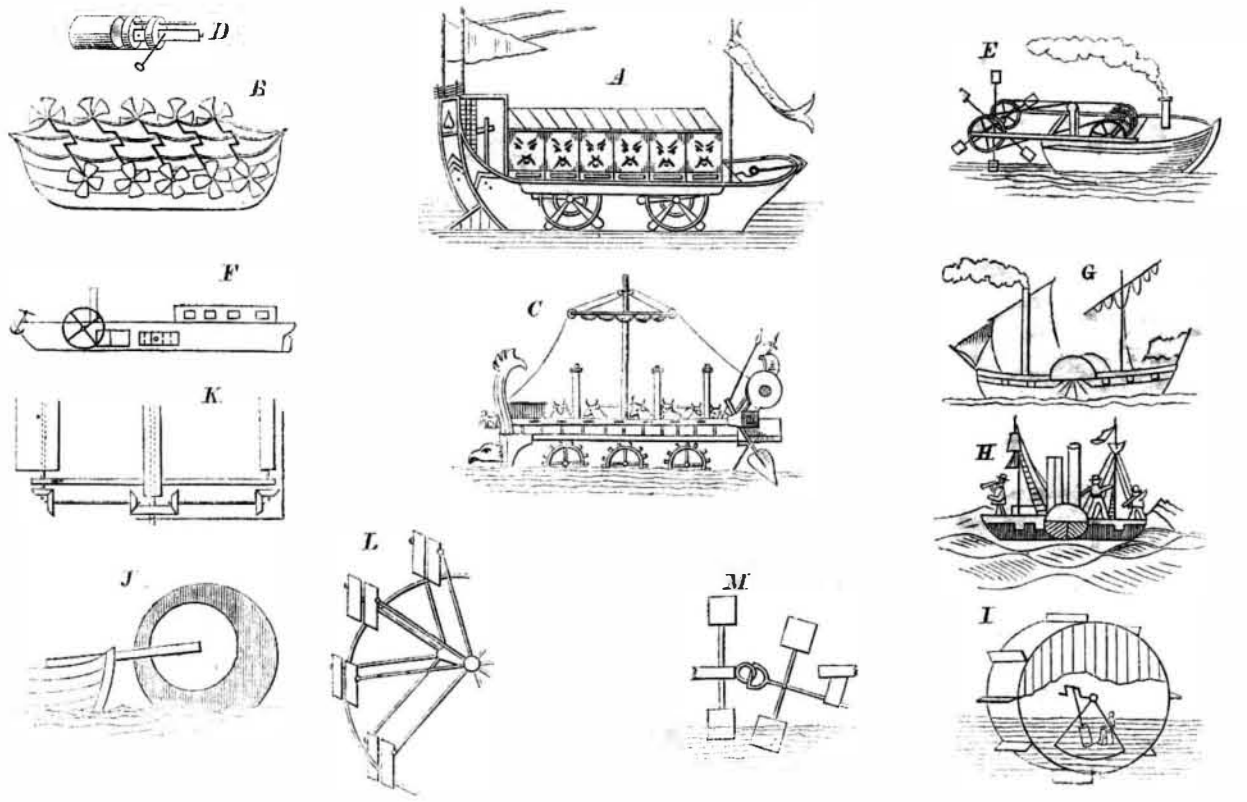
Experiments conducted about the same time, at Dalswinton, in Scotland, by Patrick Miller, resulted, in 1787, in the successful use of a steam engine, by Miller, Taylor, and Symington, to propel a vessel by paddle wheels, which worked one before the other in the center of the boat. The engine of this, the first practical steam vessel, is still preserved by Mr. Bennet Woodcroft, Superintendent of Specifications at the Great Seal Patent Office, and it may now be seen at the Patent Museum in Kensington.

The *Charlotte Dundas* was built on the Clyde canal in 1801. Although Fulton used a steamer on the Seine in 1803 and another in America, the *Clermont*, in 1807, was the first that plied so as to be remunerative in that country. In 1809, the *Fulton the First*, steam-frigate, was launched at New York. Bell built the *Comet* in 1811, at Glasgow, and used it regularly for traffic next year. In 1815, Dr. Dodd steamed from Glasgow by Dublin to London in the *Thames*, which made a stormy passage of 758 nautical miles in 121 hours.

Steam navigation was introduced into France in 1815. In 1818, Napier's steam-packets ran regularly between Greenock and Belfast. It is said that, in 1819, the *Savannah* steamed from New York to Liverpool, but the assertion is very questionable. The *Comet* first carried the Admiralty pennant in 1822. In 1825, the *Enterprise* steamed from England to Calcutta in 113 days. Guns were first carried by the steamer *Salamander* in 1832.

With respect to the various positions of paddle-wheels, it will be observed that most of those in earliest use were placed at each end of a shaft across the vessel. In Hull's plan (1736) the wheel was behind the stern; Bramah (1785), Miller (1787), and Symington (1801), placed the wheels in a passage inside the vessel open to the water. In Phillip's plan (1821) a wheel on deck turned on a vertical axis, and each float folded up to pass over the vessel. Submerged wheels on vertical axes were frequently patented. Sharples (1821) worked his wheel against the air; Harsleben (1826) placed the paddle shaft at an angle to the horizon; Robertson (1829) and Perkins (1829) kept it horizontal, but inclined to the line of the keel, and the floats being turned at an angle in the opposite direction, entered the water in the usual way. Sharpley (1856) substituted for the wheel and floats a drum carrying a spiral rib. Both these last two methods tend to propel the vessel in a line inclined to the shaft, and, in this respect, their operation is intermediate between those of the paddle-wheel and screw propeller. Bellford (1853) put the engine and cargo inside a hollow drum, with floats outside, that propelled it as the drum revolved.

In accordance with our promise we now present illustrations of some of the older forms of propellers, and from them, in a great measure, may be traced those in use to-day.



A. Chinese paddle-wheel war boat (600 years ago). Soldiers behind the tiger-head screens work the wheels within. B. Oldest drawing of a paddle-wheet boat—Valturius, 1472. C. Boat propelled by oxen turning paddle-wheels—ditto. D. The first marine steam engine—Papin, 1690. E. First patented steamboat—Hulls', 1736. F. First working steamboat—Comte de Jouffroy, 1783. G. The *Thames*, which steamed from London to Glasgow in 1815. H. Modern Chinese drawing of an English steamboat. I. Bellford's drum vessel, carrying the machinery and cargo inside. J. Congreve's mode of propelling by water rising in sponge round a wheel. K. Silvester's feathering floats (1729), worked by spindles and pinions. L. Lambert's feathering paddles (1819), kept vertical by a heavy ring. M. Galloway's additional paddle-wheel on an inclined jointed shaft.

The Oonoscope.

How many a time has a pudding been spoiled, and the milk of human kindness changed to vinegar by a bad egg! How often have we sat down to dinner, the lady of the house all smiles and pleasantry, until some dish came upon the table—the dish, perhaps, upon whose perfection she especially prided herself—and the first taste pronounced it unfit to eat, for the eggs were not fresh! What a study for a physiognomist to observe the hostess' face, then to see the clouds gathering on her forehead, the black looks at the domestics, and the general disagreeableness which replaced, with the suddeness of an avalanch, her former geniality. The meal is quickly brought to a close, the succeeding hours are miserably spent, everyone feels uncomfortable in the knowledge of a "scene" yet to come, and the unhappy matron has retired to her own room, most likely to indulge in that great balm for feminine griefs, "a good cry;" and all this misery and distress the result on an unsound egg! Had there been an "Oonoscope" in that household, no such uncomfortable event could have happened. "But what is an Oonoscope?" asks the anxious reader. We will explain. It is an entirely novel instrument for testing the quality of eggs, and consists of a small or large box, A, Fig. 1, which shows the method of using it, having a top, B, perforated with a number of holes, into which the eggs are placed, small end downwards. Two eye pieces, C, enable the observer to look into the box, and exclude all light, except that which comes through the eggs themselves. A mirror, D, seen in the section, Fig. 2, is placed at an angle in the box, and on to this the eggs are reflected by the light which passes through them, and they are seen on the mirror with all the imperfections or signs of decay which may be in the albumen or yelk. Each instrument is accompanied by a full description of their use, and the methods of detecting bad eggs.

These instruments are cheap and simple, and no household should be without either a large or small one, according to the number of eggs used in the family. They will save much annoyance and ill temper, and are much surer than the common hand test, by which the eggs are held up to the light in the hand, and it is often difficult to decide accurately on the quality.

Henry Burt, of Newark, N. J., is the inventor, and I. S. Clough, 231 Pearl street, New York, is agent in this city, either of whom may be addressed for further particulars.

New Method of Constructing Ships.

D. Vrooman, of Hudson, Ohio, has invented a novelty in ships, which enables the up-and-down motion, from the rolling of the sea, or other causes, to aid in propelling the vessel. The invention consists in forming projections on the bow, bilge, and counter of ships, whose sides shall be parallel with the keel, and whose upper and lower surfaces incline at corresponding angles at their rear terminations, and attaching to their wedge-shaped portions gutta percha, or other elastic fins or wings, in such a manner as to cause the water to impinge and act upon the inclined surfaces of the projections, and the yielding elastic fins during the upward and downward movement of the vessel through the rolling of the sea, and corresponding movement of the water, and thus propel the vessel in her course. The invention was patented this week, and the claim will be found on another page.