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INSTITUTE OF MARINE ENGINEERS INCORPORATED

SESSION



1906-1907

President : LORD PIRRIE.

VOL. XVIII

LECTURE

ON

THE INTRODUCTION OF STEAM NAVIGATION

BY

Mr. J. H. HULLS

CHAIRMAN :

Mr. JAS. ADAMSON, Hon. Secretary

*Read at 58, Romford Road, Stratford, E.,
on Monday, February 26th*

INSTITUTE OF MARINE ENGINEERS

INCORPORATED

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1906-7

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PRESIDENT : LORD PIRRIE.

VOLUME XVIII.

58, ROMFORD ROAD,
STRATFORD,

February 26th, 1906.

A MEETING of the Institute of Marine Engineers was held here this evening, when a lecture was delivered by Mr. J. H. Hulls on "The Introduction of Steam Navigation." At the close of the lecture a large number of lantern views were shown to illustrate the subject. Boats, ships and steamers ancient and modern were shown. A few of these are reproduced, showing Mr. Hulls' proposed boat, Miller's boat, "Charlotte Dundas'," and others of later date.

JAMES ADAMSON,

Hon. Secretary.

Introduction of Steam Navigation.

BY MR. J. H. HULLS.

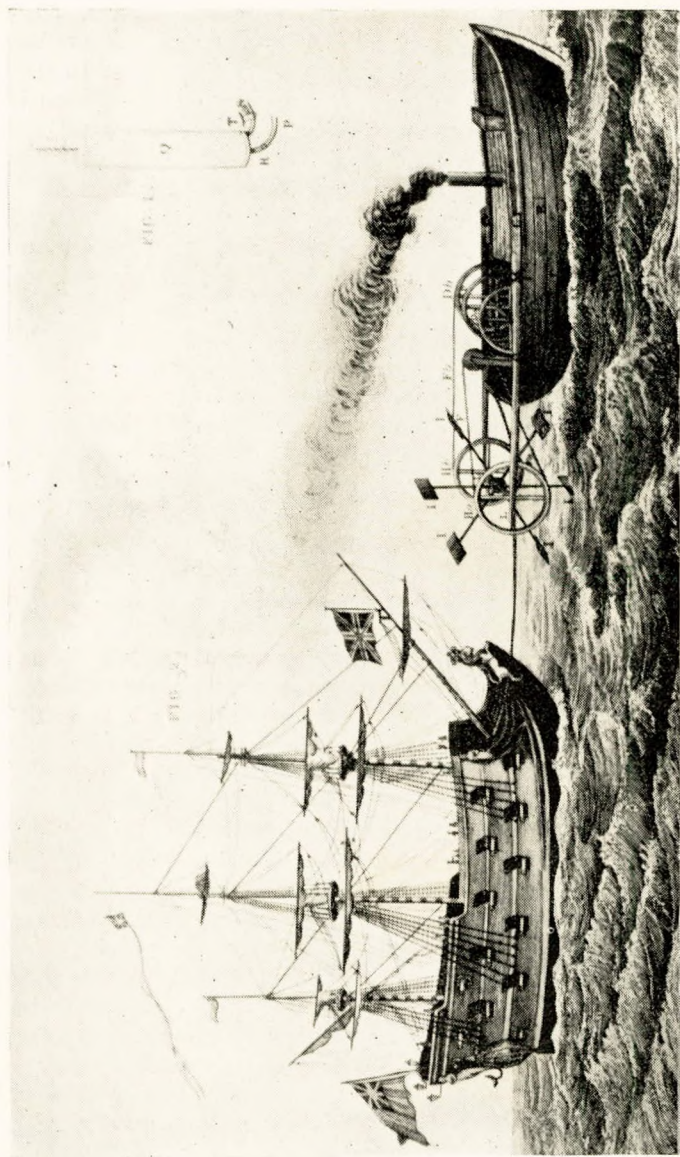
Read Monday, February 26th, 1906.

CHAIRMAN : MR. JAS. ADAMSON, Hon. Secretary.

THE CHAIRMAN. It is of great interest to know the early beginning of things, and to Marine Engineers the history of steam navigation must ever be a topic of interest, and of value as an incentive to cause them to feel a pride in their business with a desire to continue the work of improvement which has been proceeding year by year during the past century. The romance and glamour which surrounded the navigation of the ocean under sail, in connection with the history of the pioneers, their adventures and discoveries, was more apparent to the general public, than it is in connection with the later mode of propulsion under steam. The songs of Dibden tended to perpetuate, foster and encourage the romance, and had an important influence in upholding and maintaining the prosperity of Britain, in seamanship and supply of seamen. In the present day we live in more prosaic times, and the feeling of *esprit de corps* is now apparently not so strong, a fact which those who still love their profession cannot but deplore; and as the history of early pioneers, adventurers, and discoverers in mechanical science, is perhaps not so well known to young men of the rising generation of Marine Engineers as it ought to be, I have no doubt that the lecturer will not only interest them, but will enable them to realize the difficulties and labour involved by those who first directed their thoughts towards propulsion of ships by other methods than those referred to in the Motto of the Institute of Marine Engineers—“*Nec Remis Nec Velis.*” The lecturer is a descendant of one of the pioneers, and that will add to their interest.

Mr. J. H. HULLS then read as follows:—

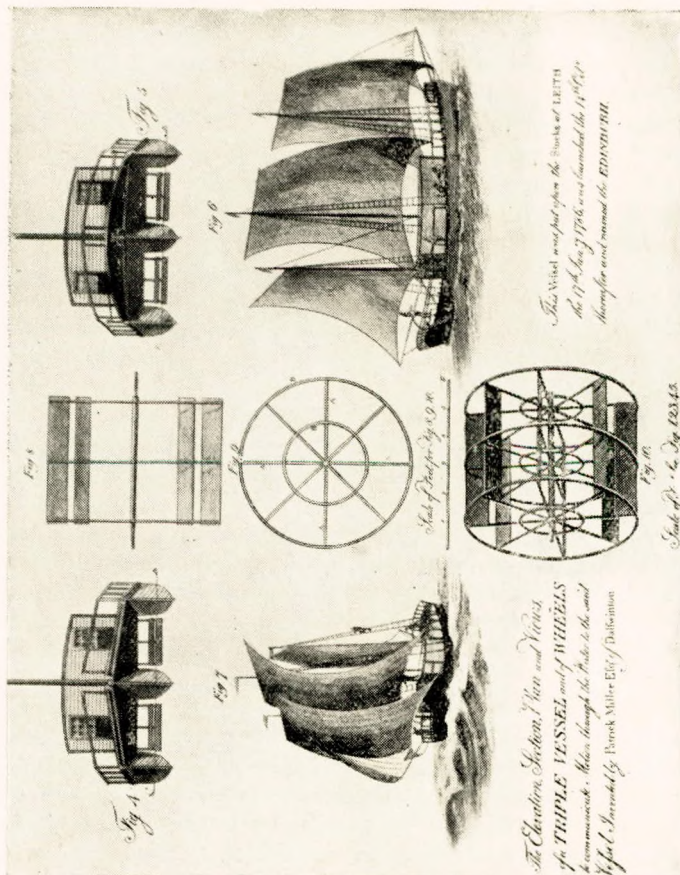
I have first to thank the Council of this Institute for granting to me, a layman as it were, the privilege of reading a paper



JONATHAN HULLS' PROPOSED BOAT, 1736.

before you. I respectfully ask your indulgence, as my occupation is of a commercial rather than of an engineering nature. My desire and purpose is to endeavour to prove, as being of interest to you as Marine Engineers, and as it is not generally known, that my ancestor Jonathan Hulls, who was born in the year 1699, was the inventor of the Steam Boat, or as it may be put, invented Steam Navigation. I have from my early years been aware of this, but did not move in the matter until some two and a half years since, when I read in the daily press that a memorial tablet had been unveiled in St. Botolph's Church, Aldgate, to the memory of Mr. Symington, who was born in the year 1763 and died 1831; the newspaper report of this ceremony of unveiling being headed "The Inventor of the Steam Boat."

Shortly afterwards on paying a visit to an old friend, Mr. George Macallan (retired manager of the G.E.R. Works at Stratford), I mentioned the matter to him, and he surprised me by saying that he had noticed in an old and valuable work of two vols. "Stuart's Anecdotes of the Steam Engine," published by Wightman & Co., 1829, that there was an engraved portrait of Jonathan Hulls as a frontispiece to one volume, and in the other a drawing and description of Hulls' "New invented machine for carrying vessels or ships out of, or into any harbour, port or river against wind or tide; or in a calm." This is really a most interesting work. I then felt urged to make further research and make the matter public, so that due honour might be paid to my kinsman for his ingenuity, without detracting from the true fame of others. I then wrote to, and had an interview with the editor of "The Engineer," and also wrote the editor of "Engineering." They both acknowledged that the subject was one of great interest, but feared that if published in their journals the resulting correspondence and discussion would occupy more space than could possibly be afforded. I afterwards called at the office of "The Marine Engineer" and was kindly received by one of the staff, who after hearing my statement expressed a wish to see the documents of which I had made mention. I forwarded them, and a lengthy article was published in the journal, mainly to the effect, that whilst admitting the early date (1736) of Jonathan Hulls patent, which as stated, no one could deny, there was no actual proof of the tradition that a boat was fitted, and that it could not be denied



MILLER'S FIRST BOAT, THE "EDINBURGH," 1787.

that Symington constructed the "Charlotte Dundas" the first steam boat fitted for practical use. I wrote again, with further details; my letter was duly published and from an accompanying article, I could only gather that the proofs submitted were not sufficiently convincing, and it was remarked that it would give pleasure if any further claims which might be submitted either by myself or readers of the journal, would lead to a crowning success. I wrote again, and that ended the matter in that quarter.

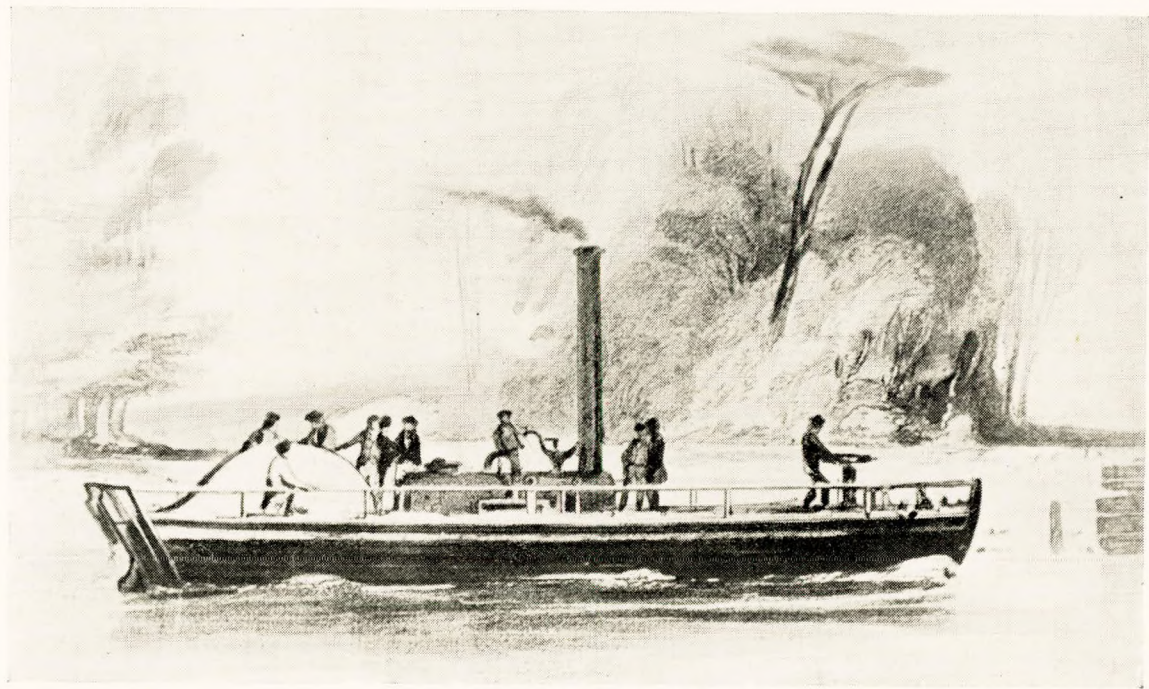
I there upon again approached this Institute with the happy result of my appearance here this evening. I do not wish to play too much upon words, but would like to mention that I have ascertained that the meaning of "Invention" as given in Walker's English Dictionary, epitomised by Smart is:—"To come, or light upon—whence its common meaning—to find out, to strike out by thinking," and that the word is derived from the Latin verb "*Invenio*" and meaning, as given in a classical dictionary:—

"I come into—I light upon—I find out," etc.

I will first refer to the Official Patent Specification No. 556, A.D. 1736, of Jonathan Hulls "Propelling Vessels," in which it is shown that:—

"Our Sovereign Lord, George the Second, in the tenth year of his reign granted him his especial license to make, use, vend, his new invention of a machine for carrying ships and vessels out of, or into, any harbour and river against wind and tide; or in a calm: the nature of his invention to consist:—

"Of two beams of timber laid parallel to each other, between which, and near each end thereof is fixed an axis, and behind the fore axis is fixed a standard of one or more upright piece or pieces of timber, with pulley or small wheel on the top; on the said fore axis is fixed three wheels and on the hindermost axis two wheels, with an intervening space, in which space are fixed six fanns that turn upon that axis; to each of the outermost wheels on the fore axis is fixed a rope, one end of which is also fixed to the hindermost corresponding wheels, and directed in an alternate manner, and another rope is to go from the left hind wheel over the standard, with a large weight at the end, so that as the wheels move backward or forward the fanns are brought into and keep a direct motion in the water, which forces forwards the vessel in which the



THE "CHARLOTTE DUNDAS," 1801.

Built by Symington.

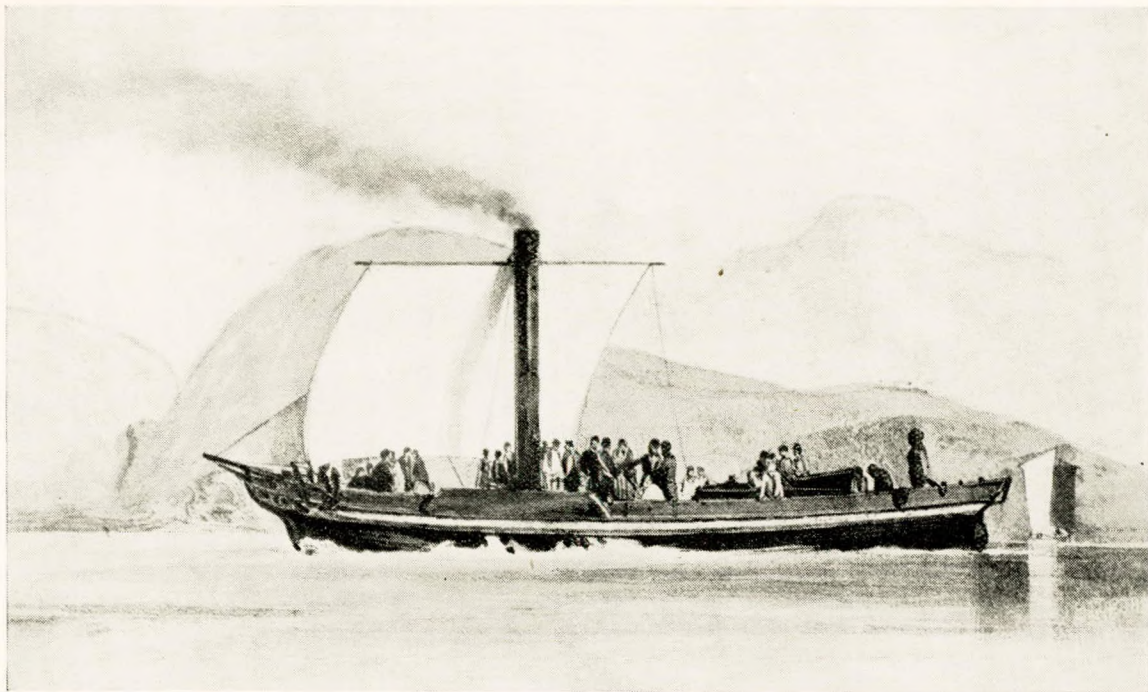
machine is placed. The power that is to put and keep this machine in motion is a fire engine which operates upon the machine in the following manner. A rope is fixed at one end to the middle of the wheel on the fore axis, and the other end to a piston which goes into a cylinder vessell placed near a boyler, containing a proper quantity of water, in which boyler the water is rarified, and from thence the stream is conveyed into the cylinder vessell, and there condensed, in order to obtain a vacuum, which causes the weight of the atmosphere to press on the piston, and so gives motion to the whole machine. This machine is to be placed and fixed on board the ship or vessell, which is to be carried out of or into any harbour or along a river, but rather in a tow boat, to be used for that purpose in shallow rivers. This machine, instead of fanns, works by two cranks fixed to the hindermost axis, to which cranks are fixed two shafts of proper length to reach the botom of the river, and which move alternately forward from the motion of the wheels by which the vessell is carryed on. For smooth and deep waters the beams of the machine will be made shorter, and proper fanns fixed to work on each side the vessell." This latter sentence points very conclusively to side paddle wheels or "fanns."

I next refer to an official document giving further particulars the title of which is:—"A Description and Draught of a New Invented Machine, etc., dated 1737, in which it states:—

"Whereas our Trusty and Well Beloved Jonathan Hulls hath by his petition humbly represented unto Our most dearly beloved Consort the Queen, Guardian of the Kingdom etc. That he hath with much Labour and Study, and at Great Expense Invented and FORMED a Machine for carrying Ships and Vessels out of or into any Harbour etc., which the petitioner apprehends, may be of great service to our Royal Navy and Merchant Ships, and to Boats and other Vessels passing against the stream in Navigable Rivers of which Machine the Petitioner hath made oath that he is the sole inventor etc." Further on in this document he gives his reason for writing and publishing the treatise viz:—

"Whereas several persons concerned in the Navigation have desired some account of my Invention for carrying ships out of or into, etc., etc., when they have not a fair wind.

"But I could not fully describe this machine without writing a small treatise of the same, in which I shall endeavour to



THE "COMET," 1812.

Built by Henry Bell.

demonstrate the possibility and probability of the matter undertaken.

“There is one great hardship lies too commonly upon those who propose to advance some new, tho’ Useful Scheme for the publick Benefit. The World abounding more in rash Censure than in a candid and unprejudiced Estimation of Things, if a person does not answer their Expectations in every point, instead of Friendly Treatment for his good Intentions, he too often meets with Ridicule and Contempt. But I hope that this will not be my case, but that they will form a Judgment of my present Undertaking only from Trial. If it should be said that I have filled this Tract with Things that are foreign to the Matter propos’d, I answer, There is nothing in it but what is necessary to be understood by those that desire to know the Nature of that Machine which I now offer to the World ; and I hope that, through the blessing of God, it may prove serviceable to my Country.”

(Signed) J.H.

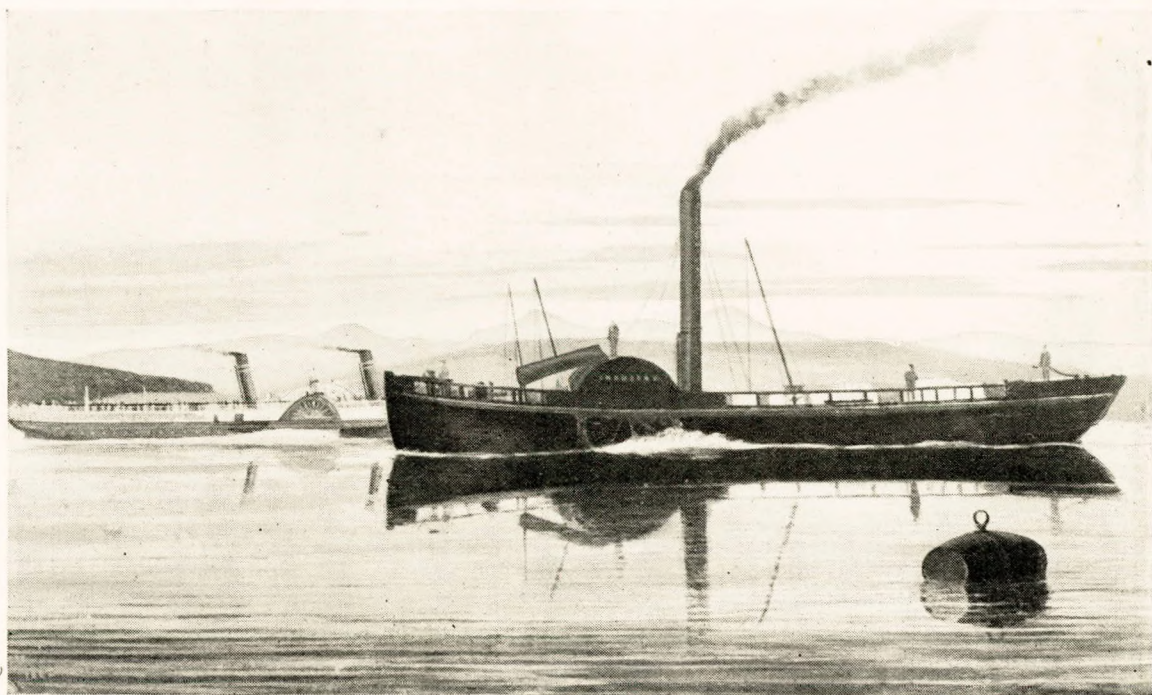
This treatise is concluded with the following words :—

“Thus I have endeavour’d to give a clear and satisfactory Account of my New-invented Machine for Carrying Vessels etc. etc. and I doubt not, but whoever shall give himself the Trouble to peruse this Essay will be so Candid as to Excuse or overlook any imperfections in the diction, or manner of writing, considering the Hand it comes from ; if what I have imagined may only appear as plain to others as it has done to me, viz :—That the Scheme I now offer is practicable, and if encouraged will be useful.”

I would particularly ask attention to the diagram contained in this document, which gives a strikingly clear and full illustration of his “New invented Machine” which I think you will admit is practically a Steam Boat.

I will now refer to a standard work, a treatise on the Steam Engine by John Bourne, 8th edition 1868 (first edition 1846). On page two it is stated :—

“That a trial of an invention of Blasco de Garay, a Sea Captain, was made at Barcelona in Spain on June 17, 1543, and that a ship of 200 tons burthen was propelled by paddle wheels at the rate of three miles per hour—” but in one footnote it is stated :—“It is not certain that the whole account of the employment of a Steam Engine is not apochryphal ; on the



THE "INDUSTRY," 1814.
Built by Fife, Fairlie.

This view was taken while the "Industry" was running on the Clyde, with one of the modern steamers in the background.

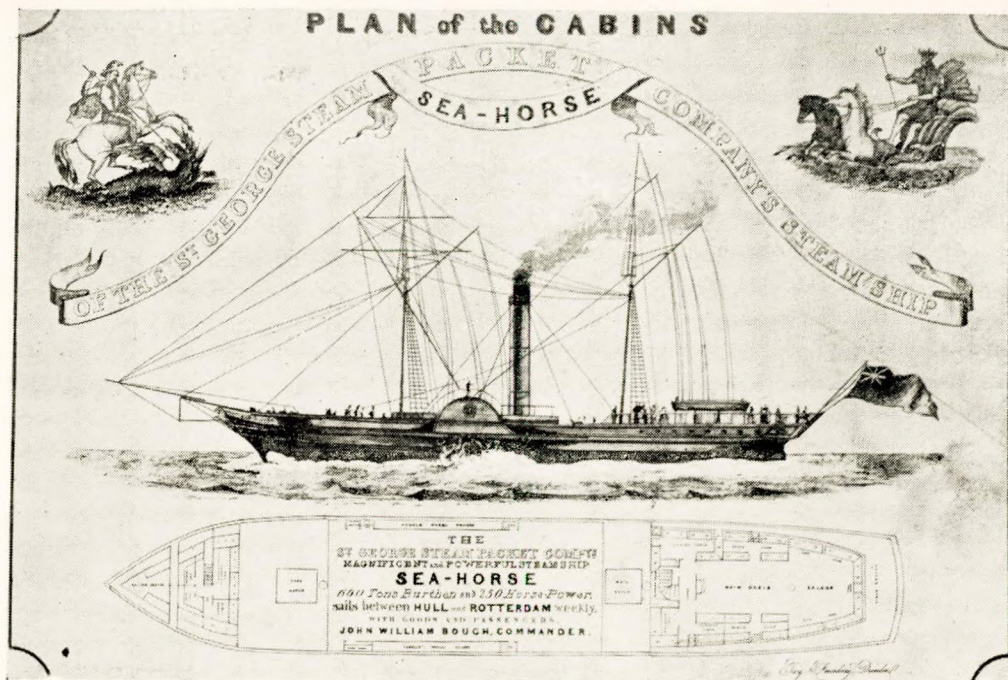
contrary, there is every reason to believe that no such experiment was ever made."

And in another footnote :—

"These reports as to Garay's invention cannot be relied on. After a search in the Spanish Archives in 1857-1858 no evidence of the use of a Steam Engine by Garay could be found (See " Woodcroft's Abridgement of Specifications of Marine Propulsion, part 2, 1858). And on page seventeen the statement is made :—

"Savery and Papin in 1702 both proposed the production of a rotary motion by means of their machines, and in 1736 Jonathan Hulls proposed to propel a boat by the agency of paddle wheels moved by a 'Newcomen Engine.' "

Mr. Bennet Woodcroft, Professor of Machinery, University College, London, and who held a responsible position in the Patent Office, made careful research, and in 1848 wrote a work on the subject viz :—"The Origin and Progress of Steam Navigation," and after describing numerous plans for working oars and paddles by animal and man power, from an early period, mentions that a work was published in 1681 in which Dr. Denys Papin proposed to supersede rowers by converting rectilinear motion from two or three cylinders, and by racks to the paddle wheel shaft of a boat, and that Savery in 1701 wrote in the "Miners' Friend" in connection with his improvement of the then Steam Engine, "I believe that it may be made very useful to ships, but I dare not meddle with that, and leave it to the judgment of those who are the best judges of maritime matters." Savery evidently knew that his engine was incapable of propelling a boat advantageously. Then follows, that in 1720 John Allen obtained a patent for navigating a boat in a calm, by forcing water through the stern of a ship by means of proper engines placed within the ship. And then, and I wish to call particular attention to it, he writes :—"Jonathan Hulls in 1736 obtained a patent, No. 556, published with a drawing." This is the first mention or trace of a drawing connected with the subject, and description of the manner in which he combined a steam engine with a boat and with a paddle wheel, and in what manner he converted a reciprocating rectilinear motion, into a continuous rotary one to drive the paddle wheel, and Woodcroft remarks Hulls' mode of obtaining a rotary motion was new and ingenious, and superior to that described by Papin, and was such as



THE "SEA HORSE," ABOUT 1826.

Built by Thos. Adamson, and engined by Peter Bourie.

would enable a steamboat to be moved through the water.

With regard to the controversy as to the builders of the first steamboat, Woodcroft writes as to Fulton that he first saw Symington on the banks of the Forth and Clyde Canal in 1801 (65 years after the date of Hulls' patent). He introduced himself to Symington, saying that he wished to see his steamboat. He obtained leave to take notes and sketches, and took his leave, and never saw Symington again.

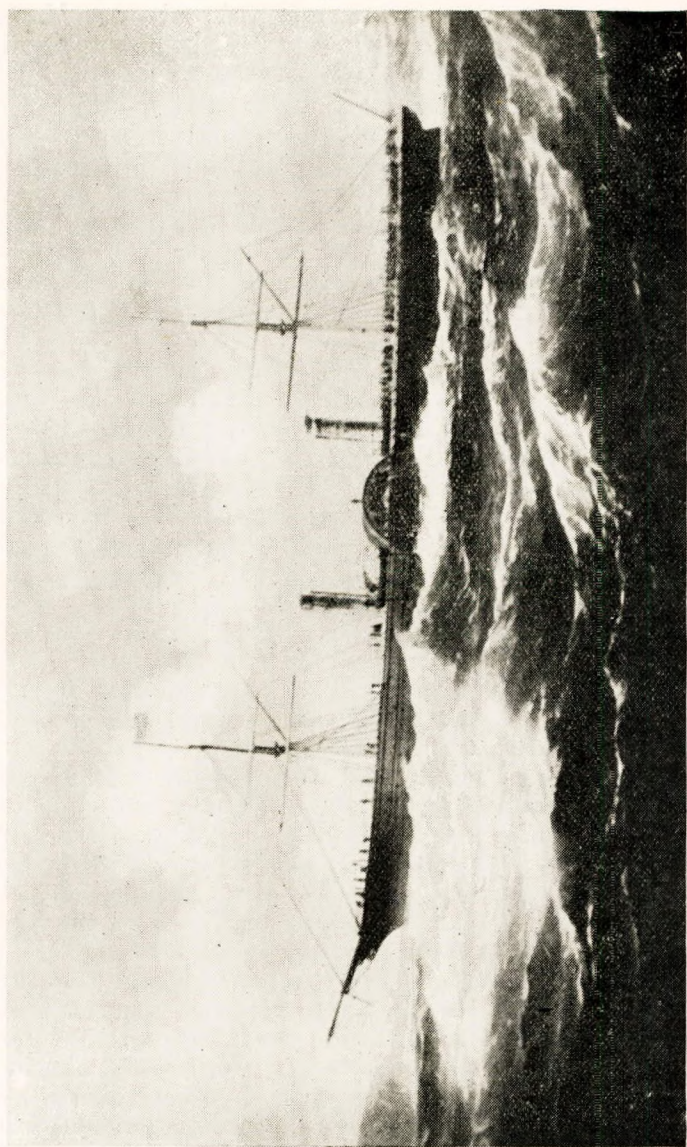
In "Locomotive Engineering" for July 1902, which I have, as also the other works quoted, which will be available for reference, published in New York, edited by Angus Sinclair, and as showing the view held in that country, there is an illustrated article to the effect :—

"What was probably the first steamboat was built by John Fitch, and is shown with this. It was only four feet long and at first only had paddle wheels. This was run in a pond near Davisville, Bucks County, Philadelphia, in 1785. Five years later, 1790, he fitted a boat with steam driven oars and ran it on the Delaware river, near Philadelphia.

"The photograph is from a 26 inch model of a yawl which ran with a screw on Collect Pond, New York City, in 1797. The construction can be seen from the photograph and is of course very crude and open to criticism, but the boat ran, and John Fitch deserves much more credit than he receives from the world at large.

"In the popular mind everything in steam engines is due to Watt, in steam boats to Fulton, in locomotives to Stephenson, and in electricity to Edison. Needless to say, and without detracting from the true fame of each, they are all wrong."

In another standard work "A Million of Facts" by Sir Richard Phillips, new edition 1859, first edition 1839, there appears in the index under the heading of "Navigation" :— "First application of Steam in 1736, page 776," and on that page is published as follows :—"The first idea of Steam Navigation was set forth in a patent obtained in 1736 by Jonathan Hulls for a Machine for carrying etc., etc. In 1778 Thomas Paine proposed in America this application of steam. In 1781 the Marquis de Jouffrey constructed one on the Saône, and in 1785 two Americans published references on it. In 1789 Symington made a voyage in one on the Forth and Clyde Canal, and in 1802 the experiment was repeated



THE "PERSIA," 1855.
Built by Robt. Napier, Glasgow.

with success. Soon after Fulton went to America ; and in 1809 started a Steam Boat on the Hudson River, which succeeding, was imitated by hundreds." In another work entitled " Railways, Steamers and Telegraphs," by George Dodd, published by W. and R. Chambers, 1868, on page 118 it is stated, corroborating what is also written in the books of earlier date which I have referred to.

" Attempts were made to move boats by revolving paddles long before the steam engine was invented. The Egyptians Romans, and Chinese navigated boats with paddle wheels rotated by oxen, and Savery effected the same thing through the medium of manual labour."

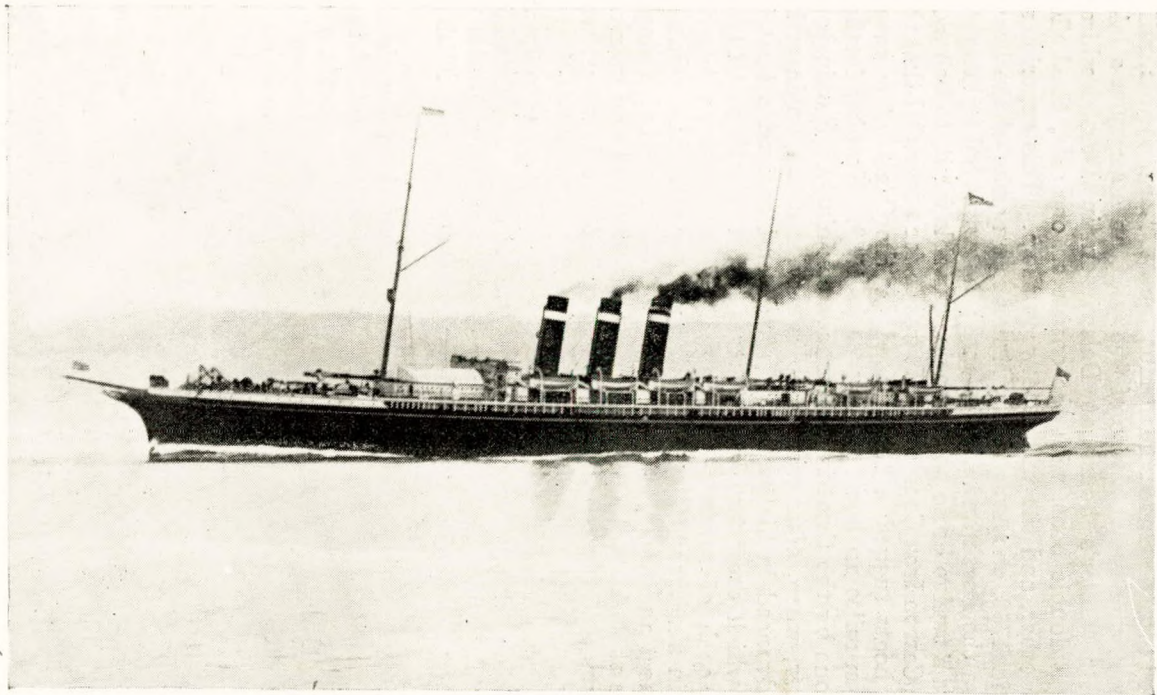
" A claim is put forward to the invention of Blasco de Garay, but both internal and external evidence tells against its authenticity," and after mentioning propositions on the part of the Marquis of Worcester and even Papin, it follows that Dr. John Allen in 1730—

" Described a plan for propelling vessels by forcing a stream of water out of a pipe, at or near the stern, steam being employed to force the water, and the vessel moving by the reaction produced."

Then it is further written :—

" Jonathan Hulls obtained a patent in 1736 for a tug boat worked by steam, the steam engine communicated its power by means of a rope to a kind of paddle wheel attached to the vessel, which was to be towed."

" We now come to Scotland, to which the real, effective, practical invention of the steam vessel may be more justly attributed, than to either England or France. Mr. Patrick Miller, a banker at Edinburgh, about the year 1787 invented a double boat, with a paddle wheel in the middle, but it was not a steam boat for he employed a man to work the wheel. Another double boat, with two men to work two wheels, ran a race against a fast-sailing custom-house boat. The £3,000 which Mr. Miller spent in these inventions was not wasted, seeing that they led to important modifications. Mr. James Taylor, a tutor in Mr. Miller's family, had assisted him in his experiments, and now suggested the application of a small steam engine to supersede the labour of a human wheel-turner. Mr. Miller, entering into the plan, employed Mr. Symington, a mining engineer at the Wanlockhead Lead Mines, to make the engine. A little one-horse power steamer (still



THE "CITY OF PARIS," 1889.
Built by I. & G. Thomson, Clydebank, Glasgow.

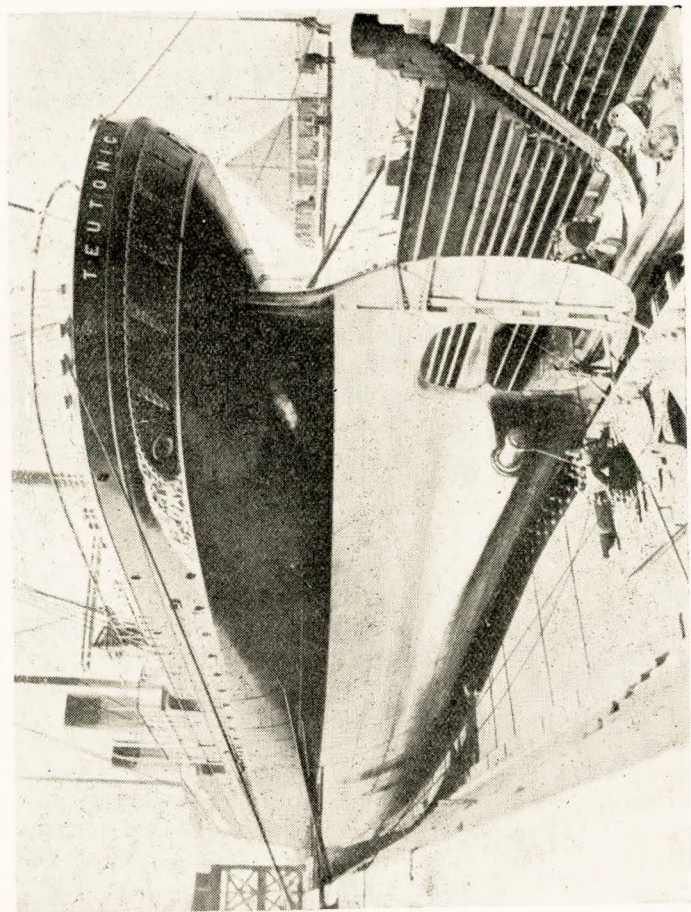
preserved in the Andersonian Museum at Glasgow) was built, and was propelled at a rate of five miles an hour upon a lake near Mr. Miller's house at Dalswinton in Dumfriesshire; it was a double boat, with the engine on one side, the boiler on the other, and the wheel between them. This experiment made in 1788, encouraged Mr. Miller to buy one of the boats used on the Forth and Clyde Canal; he employed Symington to plan a twelve horse power engine suitable for it, to be made by the Carron Iron Company. It was so far successful that the steam boats tugged a heavy load on the Canal at a speed of seven miles an hour. This was in 1789. Nothing further was done by the three ingenious men conjointly. Symington, however, when, after several years service as an engineer he had advanced in his profession, made and engined a boat in 1802, which drew two laden barges on the Forth and Clyde Canal each of seventy-two tons burthen; it went twenty miles in six hours against a very strong wind. The steamer was short and had a horizontal engine, which worked a single paddle at the stern by means of a connecting rod and crank."

Amongst those who visited and inspected this vessel was Henry Bell.

Before concluding this paper I would like you to know something of Jonathan Hulls' life and history, as related in Percy C. Rushen's book, "The History and Antiquities of Chipping Campden in the County of Gloucester," published 1899.

"Little as it is known, yet it is true that Campden should claim notice as being the stage upon which one act of that great play of progress—the development and application of steam power—was played, for it was the scene of the conception of Jonathan Hulls, one of the first to realize the possibility of applying steam power to marine propulsion, and an inventor, who, had he met a Mathew Boulton, would have been as deservedly honoured and renowned as James Watt. Jonathan was a son of Thomas Hulls and Mary, his wife, and was born at Aston Magna in 1699. When Jonathan was very young, his father, who was a village mechanic, removed to Campden, and it is said, sent his son to the Grammar School there, and afterwards apprenticed him to the clock making—or rather clock repairing—a rather precarious occupation in those days, in rural districts.

"During the earlier years of manhood, Hulls bore the repu-



THE "TEUTONIC," 1890.
Built by Harland & Wolff, Belfast.

tation of being a thoughtful and studious man, and his neighbours are said to have regarded his superior mental powers with no small degree of respect. It is asserted that that idea which has given him some claim to posthumous honour occurred to him while he was yet young, and was matured in his own mind long before any channel was opened through which he could hope to make it known to the world, for Hulls had a young family to support and no means beyond a poor and precarious handicraft.

"A patron at last appeared in a Mr. Freeman of Batsford Park, near Hulls' birthplace, who supplied the inventor with the necessary funds (about £160) to develop and patent the invention. Thereupon Hulls proceeded to London, and petitioned Queen Caroline, as Guardian of the Realm in the absence of her Consort, George II, at Hanover, for letters patent for the invention, which were accordingly granted to him December 21, 1736, No. 556, securing to Hulls the benefit of his idea in England and Wales for fourteen years, provided he enrolled in Chancery within the following three months a specification describing the invention." I omit the working details given by Mr. Rushen as they are only a repetition of those given earlier in this paper.

"About this time it may be presumed that Jonathan set about constructing a vessel in accordance with his plans and for this purpose he had the help of the Eagle Foundry at Birmingham, to which he forwarded rough model plans and sketches to aid in founding and forging the various parts. Until quite recent years these relics were existent, but on the sale and demolition of the Foundry they seemed to have been destroyed.

"The new vessel was tried on the 'Avon' at Evesham, but tradition says it was a failure, by reason of the inventor not providing the proper means to communicate the power to the paddle. That the experiment was a failure seems evident from the fact that nothing more was heard of the boat, but for the given reason is very improbable, because the very ingenious means the inventor describes, although perhaps not quite practical on a large scale, are not palpably unworkable for a small experimental boat. Even if these means were a failure, it would be ridiculous to suppose that a clever mechanic such as Hulls shows himself to be in his pamphlet would be at a loss for some expedient.



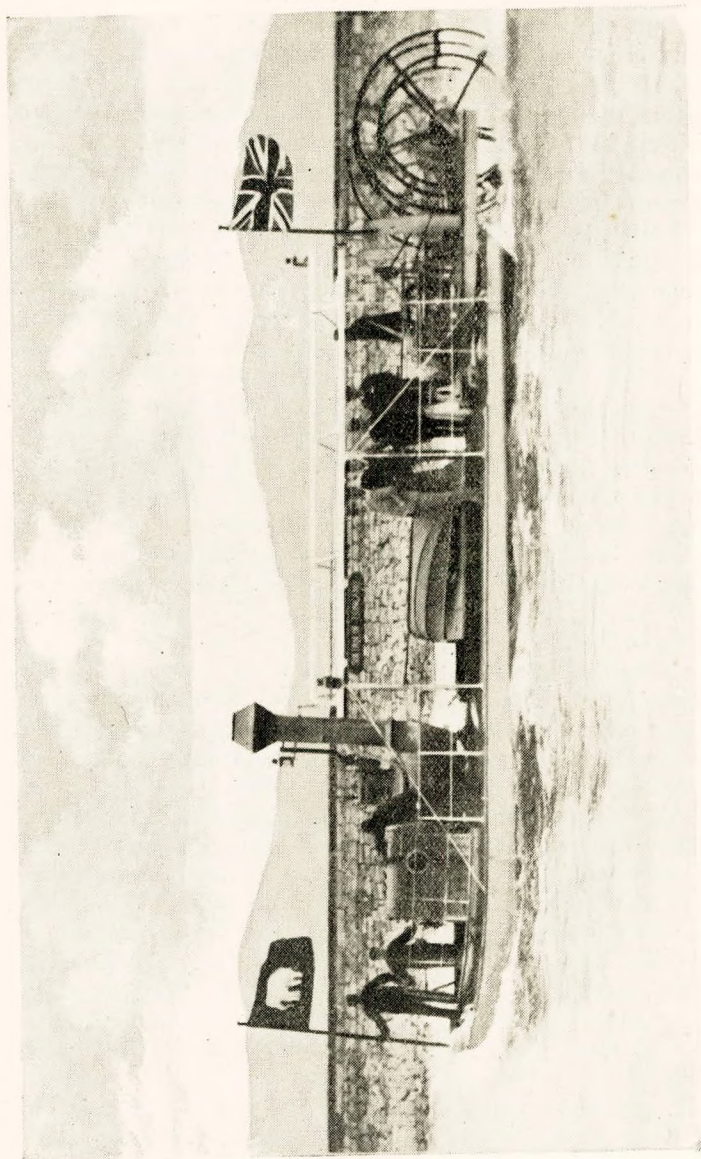
THE "MARIA RICKMERS," 1896.
Built by Thomson & Son, Sunderland.
Auxiliary Screw Engines.

“The more probable reason of Hulls’ failure was the want of financial support, that previously accorded him being perhaps withdrawn on the first hitch in the experiments, or for some other reason, this so disheartening him that he relinquished the idea. While Hulls had been at work on his project, he had worn a brown paper cap, as usual with mechanics at that time, and this fact was taken advantage of in a scathing doggerel, which was circulated upon his failure, and which ran :—

“Jonathan Hull
With his paper skull;
Tried to make a Machine
To go against wind and tide,
But he, like an ass
Couldn’t bring it to pass
So at last was ashamed to be seen.”

This concludes my lecture, and I have to thank you for having listened so patiently. The interest which you have shown has encouraged me through my address, and I hope that it has laid in your mind the foundation of that which after due consideration may lead to the acknowledgment of what I have striven to obtain viz :—that my ancestor Jonathan Hulls was the first “Inventor of the Steam Boat,” “that mighty agency which has revolutionized at once our commerce and our warfare.”

The CHAIRMAN : Mr. Hulls has referred to some of the facts and traditions of the beginnings which led to the introduction of steam navigation. The first intimation we have of a steam engine proposed for ship propulsion was about 1545 by De Garay, then by Papin and Savery about 150 years later, when the Marquis of Worcester was working at steam propulsion for land carriages, To Papin appears to be due the introduction of the piston where formerly the steam was used direct for raising water after the manner of the injector or ejector. Newcomen made a further improvement in the boiler about the year 1715. If the tradition regarding the Spaniard De Garay having propelled a boat by a steam engine in the harbour of Barcelona in 1545 be a myth, then the Frenchman has the next claim, as it has been stated that he had a boat on the Seine, driven by paddles with steam as the motive power, about the year 1690, although there was no immediate practical outcome, owing, it has been stated, to the expense involved. Dr. Allen was working in the direction of water jet propulsion, and

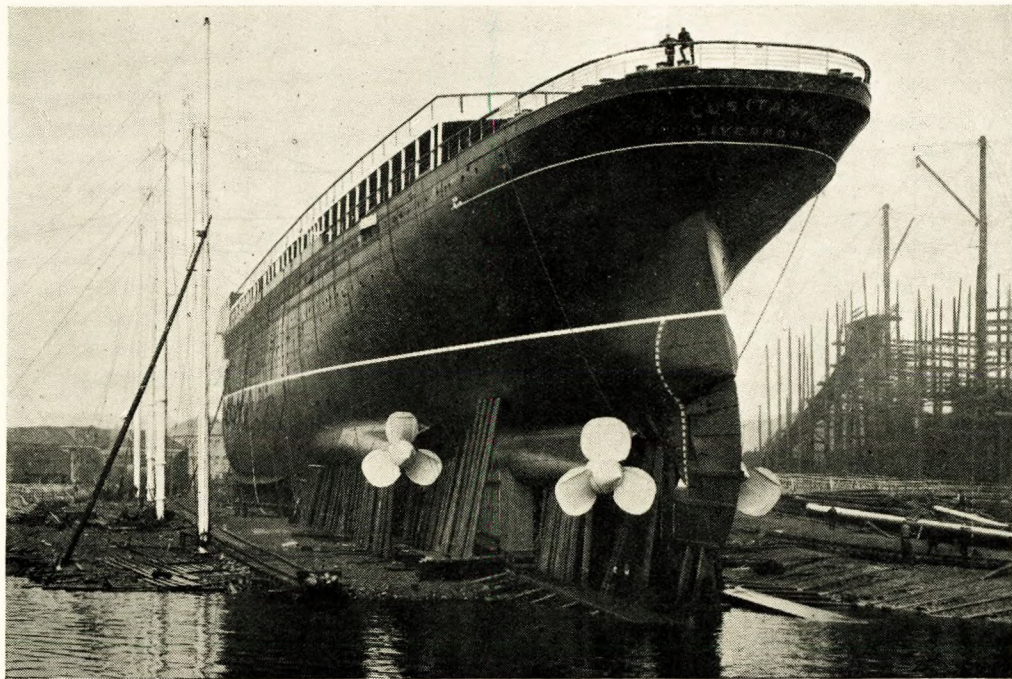


A STERN WHEELER FOR SIAM, 1896.

took out a patent about 1730. Then a few years later came the patent of Jonathan Hulls, whose claims as the originator of steam navigation have been placed before us this evening by one of his descendants. He proposed to propel a tow-boat by means of a stern wheel, the motive power being an atmospheric engine of the latest pattern then in vogue. The introduction of the crank about this time rendered the advance of the steam engine for many purposes much more progressive and likely than in the days of De Garay and Papin, when Watt appeared on the scene with his improvements. We have no assurance that a boat was run by Jonathan Hulls, although his proposal and idea was before the public. The first real success was apparently the pleasure boat actuated by side paddles, belonging to Miller, and sailed at Dalswinton in 1788, engined by Symington—a record of whose life is in the Institute Library. This was followed by the *Charlotte Dundas*, named after Lady Dundas, about 60 feet long, and run on the Forth and Clyde Canal from Grangemouth, engined by Symington, also about 1799. The *Comet* followed on the Clyde in 1812, associated with Henry Bell, whose remains are interred in the churchyard at Row on the Gareloch, under a monument erected by R. Napier, of Clyde fame. I considered that it would add greatly to the interest of our meeting to-night to show some lantern slides to illustrate the progress of steam navigation from the days of Jonathan Hulls to the present day, and after the discussion the views will be shown on the screen, including Jonathan Hulls' proposed boat, Miller's boat, the *Charlotte Dundas*, *Comet* and others.

Mr. J. CLARK said he thought Mr. Hulls had brought the matter before them with full detail. He had searched for proof and had consulted various works, and no one could gainsay at what cost. There was no denying the fact that the world looked for success, and it was the successful man who got the credit, whether due to him or not. He personally had not much to say on the matter, but he could not help thinking in looking at the diagram that Mr. Hulls had shown them, how much the hull resembled the modern yacht of the present day.

J. R. RUTHVEN: The subject of Mr. Hulls' paper is most interesting. The work of many men, extended over a number of years, is necessary to give us the advantages we possess to-day. The man who invents and the man who works out



THE "LUSITANIA," 1906.
Built by John Brown & Co., Clydebank, Glasgow.

the invention are sometimes different men, living years apart. The reference to water jet propulsion shows how this subject has occupied men's minds at an early date, long before paddle wheels.

Mr. W. McLAREN said he would like to thank Mr. Hulls for his lecture and compliment him on the pluck and perseverance he seemed to have expended, both in time and money, to prove that his ancestor was the first to apply steam power to propel ships or boats through the water. There was no denying his proof as to a patent being granted, but if he might be allowed, he would quote part of a paragraph on the progress of shipping from the Naval, Shipping and Fisheries' Exhibition Catalogue and Guide to the Exhibition, held at Earl's Court, London, in 1905, as follows: "The growth of the British Mercantile Marine therefore furnishes a story of peculiar interest. It is, however, in its modern aspect that the progress of shipping claims attention on the occasion of the present exhibition, consequently it is hardly necessary to examine the experiment which Denis Papin conducted early in the eighteenth century, when in a paddle wheel steamer on the river Fulda steam was first applied for purposes of marine propulsion; but it is interesting to note that exactly one hundred years elapsed before any passenger steamer was continuously employed." There they had a statement quite the reverse to Mr. Hulls' claim.

Mr. HULLS: I would most certainly like to have an expression of opinion as to whether my ancestor was the inventor of the steamboat; if the Chairman would not mind putting that to the meeting, I would be very pleased.

The CHAIRMAN: It is open to the meeting to make a proposition on the subject.

Mr. W. McLAREN: To give such an endorsement is, I think, asking too much from the members of the Institute, or even to pledge themselves in favour of Mr. Hulls' claim, and have it recorded in the transactions. I propose that we accord a vote of thanks to Mr. Hulls for his paper. I admire him for the way he has persevered in holding forth his ancestor as the pioneer of steamboat propulsion, even while I cannot commit myself to the proposition he puts forward.

Mr. J. CLARK seconded the vote of thanks.

Mr. HULLS : I beg to thank you most heartily for the vote of thanks. At the same time I hope I have not been asking too much. I stated in my lecture that William Symington had had this honour accorded to him, but I think it would be rather difficult to prove that William Symington was the inventor.

The CHAIRMAN : I think Symington is looked upon as the one who made steamboat propulsion an assured success. I do not think Symington has been looked upon as the originator of the idea of a steam engine being applied to a boat, and regarding such a statement quoted from one or more newspapers, I should not consider that sufficient evidence of matter of fact. We can only judge from the records we have from well authenticated authorities.

The meeting terminated with a number of lantern views descriptive of the advancement made from the early types of boats, sailing ships and steamers, to the present day steamers and up-to-date vessels.

The following letter has been received on the subject, and we have much pleasure in acknowledging and publishing it.

June 22, 1906.

MR. ADAMSON, *Hon. Secretary*,
Institute of Marine Engineers.

DEAR SIR,—

May I beg the favour of your kindness to insert a small addition to the paper read before your Institute dealing with "The Invention of the Steamboat," a report on which I have read in the *Marine Engineer* of March 2.

We, *Francs. Comtois*, are proud to count a fellow-citizen amongst the pioneers of the steam shipping as we now know it—Marquis of Youffroy d'Abbans, who was born in 1751 and died in 1832, experimented on the river Doubs with one of the earliest steamboats.

The statue of the precursor erected in Besançon (Doubs) commemorates this event.

Marquis of Youffroy and Abbans, I believe, has yet lineage

in Franche. Comté, more qualified than I am to give accurate intelligence on the subject. With my best compliments to my British colleagues,

Dear Sir,

Yours truly,

J. GUYENOT.

Chief Engineer, s.s. *Poiton*,

Cie. Transports Maritimes, Marseille,

H. GUYENOT, Engineer,

Impasse Assani,

Josepha Cottage,

Malmousque, near Marseille.

From the large number of views which were exhibited after the lecture, a few are reproduced to show the stages of progress from the proposed boat of Jonathan Hulls to the more recent types of steamships. These are as follows:—Jonathan Hull's boat (1736); Miller's first boat, *The Edinburgh* (1787); the *Charlotte Dundas* (1801); the *Comet* (1811); *The Industry* (about 1814); the *Sea Horse* (about 1826); the *Persia* (1855); the *City of Paris* (1889); the *Teutonic* (1890); the *Maria Rickmers* (1896); a *Sternwheeler* for Siam (1896). These are all from lantern slides.

The dimensions of the new Cunarder *Lusitania* may be fittingly referred to as showing the latest advancement upon the other illustrations shown. By the kind courtesy of Messrs. John Brown & Co., Clydebank, a view of the ship just before launching is included in the number of illustrations.

Lusitania, 785 ft. long by 88 ft. by 60 ft. 6 in.; 32,500 tons gross, and 38,000 tons displacement; 68,000 I.H.P., and 25 knots speed, the steam pressure being 200 lbs. There are four sets of Turbines and four propellers. There are 25 cylindrical boilers, 192 furnaces, 160,000 sq. ft. heating surface. Coal consumption for a run to New York estimated 5,000 tons. Number of passengers provided for 2,350.

J. A.



IN connexion with the Engineering Exhibition to be opened at Olympia on or about September 15, Mr. A. E. Battle (member) has kindly offered a prize to be competed for by Graduates (apprentice engineers) of the Institute, who are each invited to write an essay on a visit to the Exhibition, such essay to be certified as the sole personal work of the writer.

To be read at Olympia, Saturday, September 29, joint papers on *The Development of the Steam Turbine* by the Hon. C. A. Parsons, C.B. (Past President), and Mr. M. Walker. Paper by Mr. A. E. Battle (member) on *Sanitary Science as applied to Marine Engineering*.

