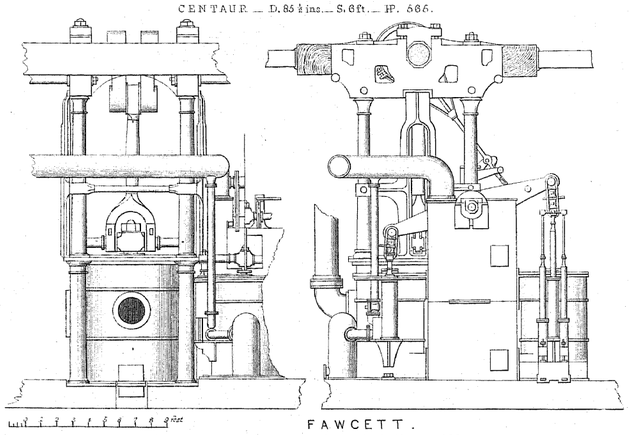
A COMPARATIVE VIEW OF DIRECT ACTION ENGINES.

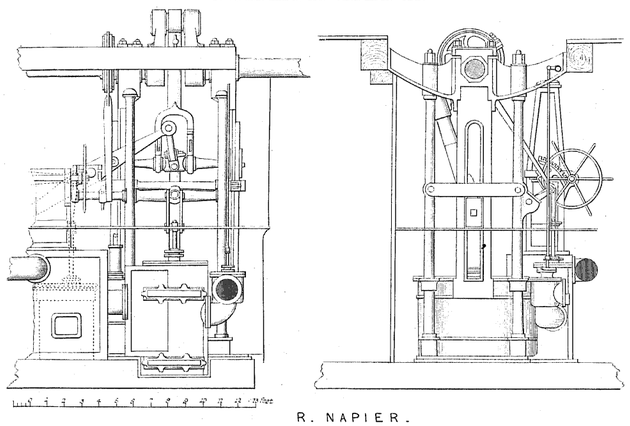
Referred to in "Artizan Club's Treatise on the Steam Engine." Edited by
J. BOURNE, C. E.

P 28 & 29

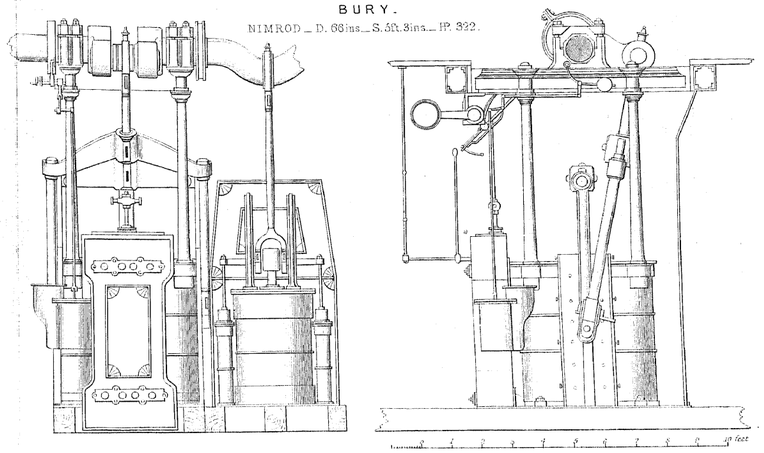
BOULTON & WATT.
CENTAUR — D. 85 ½ ins. — S. 6 ft. — IP. 566.



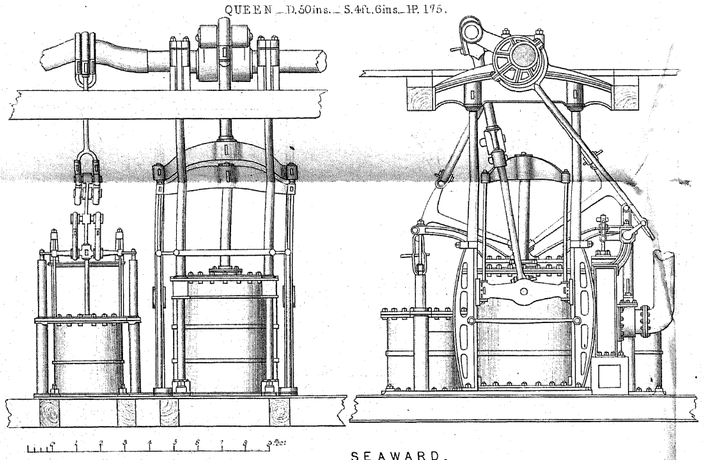
SCOTT & SINCLAIR.
D. 75 ins. — S. 5ft. 6ins. — IP. 422.



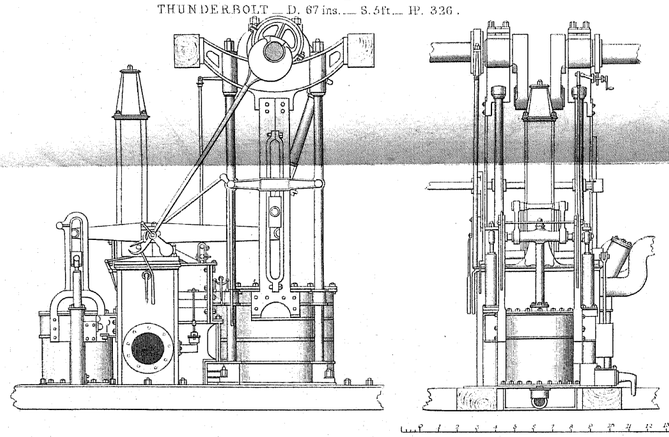
BURY.
NIMROD — D. 66 ins. — S. 5ft. 3ins. — IP. 322.



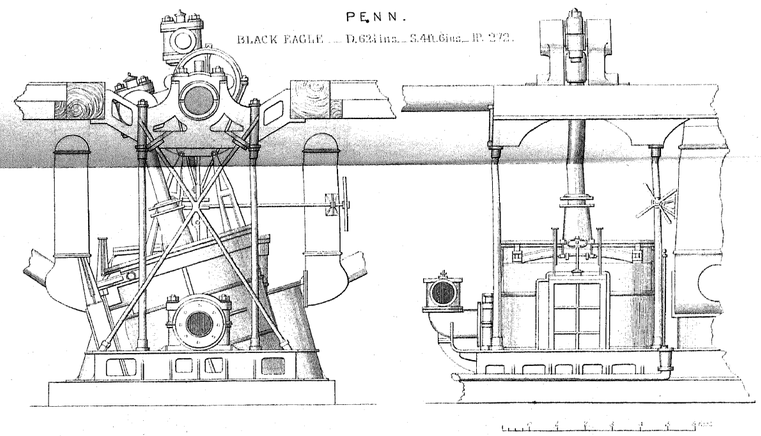
FAWCETT.
QUEEN — D. 50 ins. — S. 4ft. 6ins. — IP. 175.



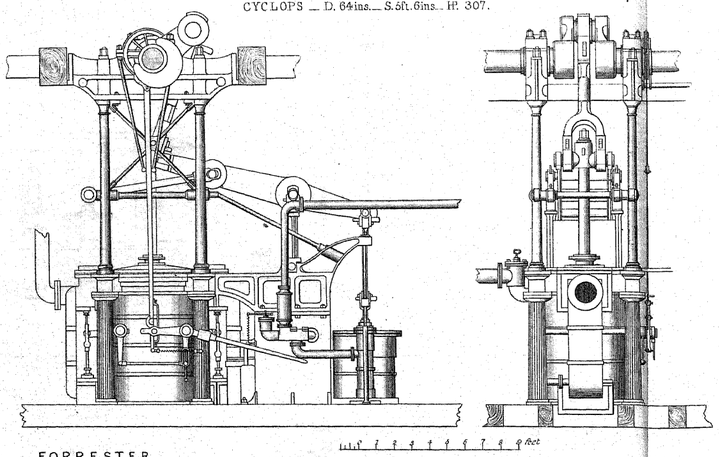
R. NAPIER.
THUNDERBOLT — D. 67 ins. — S. 5ft. — IP. 326.



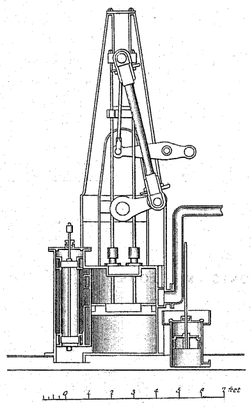
PENN.
BLACK EAGLE — D. 63 ½ ins. — S. 4ft. 6ins. — IP. 272.



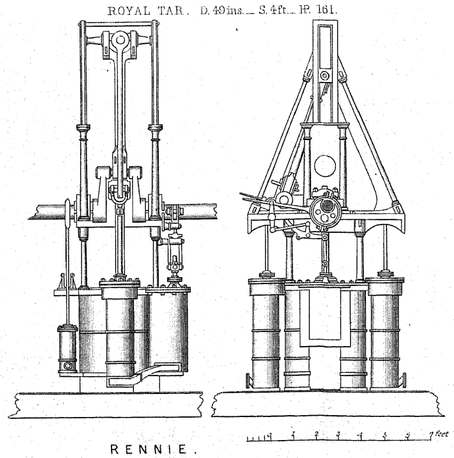
SEAWARD.
CYCLOPS — D. 64 ins. — S. 5ft. 6ins. — IP. 307.



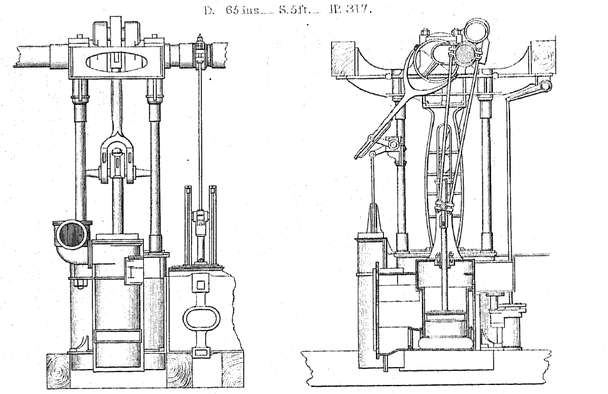
D. NAPIER.
FAWN — D. 33 ins. — S. 3 ft. — IP. 67.



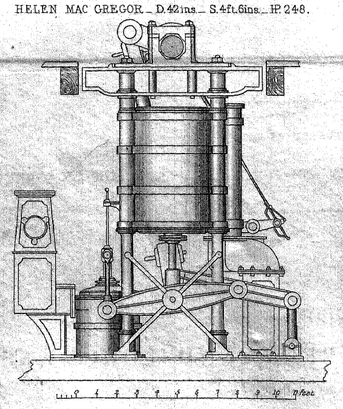
TOD & MACGREGOR.
ROYAL TAR. D. 40 ins. — S. 4 ft. — IP. 161.



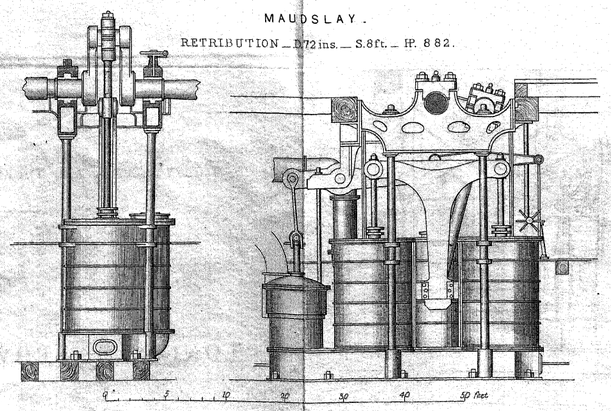
MILLER.
D. 65 ins. — S. 5ft. — IP. 317.



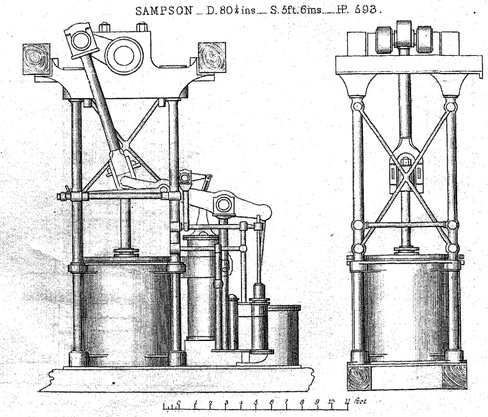
FORRESTER.
HELEN MAC GREGOR — D. 42 ins. — S. 4 ft. 6ins. — IP. 248.



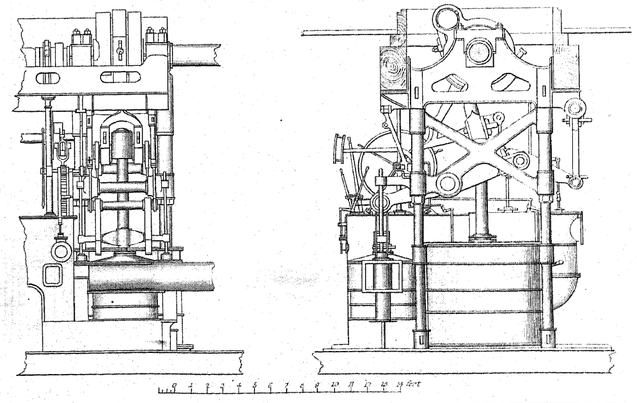
MAUDSLAY.
RETRIBUTION — D. 72 ins. — S. 8 ft. — IP. 882.



RENNIE.
SAMPSON — D. 80 4 ins. — S. 5 ft. 6ins. — IP. 593.



FAIRBAIRN.
ODIN — D. 88 ins. — S. 5 ft. 9 ins. — IP. 590.



H. Adlard, sc.

London: Longman, Brown, Green, & Longmans, 1846.

A

TREATISE

ON THE

STEAM ENGINE

IN ITS APPLICATION TO

MINES, MILLS, STEAM NAVIGATION, AND RAILWAYS.

By the Artizan Club.

EDITED BY

JOHN BOURNE, C.E.

ILLUSTRATED BY

THIRTY PLATES, AND THREE HUNDRED AND FORTY-NINE ENGRAVINGS ON WOOD.

LONDON:

LONGMAN, BROWN, GREEN, AND LONGMANS,

PATERNOSTER-ROW.

1846.

London:
Printed by A. Spottiswoode,
New-Street-Square.

TO

HER MOST GRACIOUS MAJESTY

THE QUEEN,

THIS TREATISE ON THE STEAM ENGINE BY THE ARTIZAN CLUB

DESCRIPTIVE OF THE STRUCTURE AND PRINCIPLES OF ACTION OF

THE GREAT MECHANICAL AGENT

WHICH HAS FOUGHT THE BATTLES OF THE EMPIRE, AND NOW SUSTAINS ITS GREATNESS;

WHICH BINDS NATIONS TOGETHER IN AMITY,

ANNIHILATES DISTANCE, SOFTENS NATIONAL PREJUDICES, AND PROMOTES CIVILISATION;

WHICH BRITISH ARTIZANS HAVE BROUGHT TO ITS PRESENT PERFECTION,

AND

WHICH BRITISH ARTIZANS NOW ASPIRE TO ILLUSTRATE,

IS,

By Her Majesty's Permission,

MOST RESPECTFULLY INSCRIBED,

BY

HER MAJESTY'S OBEDIENT SUBJECT AND SERVANT,

JOHN BOURNE.

PREFACE.

THE present Work makes its appearance under many disadvantages. The circumstance of having been published in monthly numbers furnishes, of itself, an explanation of many imperfections; for it can hardly be expected that works produced under the exigencies of periodical publication should be distinguished by the perfections which belong to literary leisure and fastidious elaboration. The time which the practical engineer can devote to literary undertakings must, under any circumstances, be inconsiderable, and the late pressure in the engineering world has further abbreviated this precarious leisure. I have been obliged to confide the greater portion of the theoretical part of the present work to some mathematical assistants, whose algebra has, I fear, sometimes risen to a needless luxuriance, and in whose superfine speculations the engineer may perhaps discern the hand of a tyro. The makers of steam engines, again, have, for some time past, been so overwhelmed with work, that the drawings and other particulars of their machinery, which they had signified their willingness to furnish, they have in some cases been unable to send early enough to come in at the proper place; and faults of arrangement have been rendered inevitable by these irregularities, which I could neither rectify nor control. I do not mention these impediments to a more perfect execution as an excuse for any faults the work may contain, which I am sensible cannot be materially extenuated by such pleas; but I wish merely to suggest, that the demerits of an author or editor are not fairly measurable by the demerits of his work, when many of those faults have had their origin in the unpropitious circumstances of its production. In spite, however, of its imperfections I believe that the present Treatise on the Steam Engine is likely to prove the most useful yet published; and it is the only one, I believe, which can be regarded as of a really practical character. Although falling far short of my conceptions of what such a work should be, I believe that it substantially fulfils the promise held out in the prospectus; and having now collected the rough materials, I trust to be able, should another edition be called for, to clear them of the dross by which they are now disfigured, and present them in a form that will in some measure justify the public approbation. In the haste of publication several errors have gained admission, the more prominent of which are noticed in the errata. I am by no means insensible to the importance of rigid accuracy in works of any scientific pretension; yet, inasmuch as I believe the errors of the present work will be found to be errors, not of ignorance, but, at the worst, of haste or inadvertence; as they inculcate no false views, involve no dangerous fallacy, and, for the most part, carry their own correction, I believe that they cannot materially diminish the utility of the work, or impair the authority of its statements.

The success of the present work, in a commercial sense, has long been put beyond doubt by the circulation it has reached; and from the press it has received a greater measure of praise than, I fear, its merits justify. The preliminary and practical portions of the work have, for the most part, been executed by me, the disquisitions upon the slide valve and parallel motion are taken from the "Artizan," and other portions of the work are by various members of the Artizan fraternity. In the practical part of the work I have been able to obtain but little assistance from previous authors, and many of the subjects discussed are now brought for the first time before the public. Mr. Farey's work, though of great merit, gives but little information of any kind touching modern engines; and Tredgold's work is chiefly made up of mathematical sublimities, which have but little relation to practice. From this judgment must be excepted the admirable description by Mr. Robert Stephenson of his locomotive engine, contributed to Tredgold's work; but the utility of that description is greatly diminished by the changes introduced into the locomotive engine since the time it was written, and by its own