Scientific American

NEW YORK, OCTOBER 26, 1850.

The First Steam Engine.--James Watt.

The Albany Knickerbocker states that Ex-Mayor John Taylor, of that city, while on a recent visit to England, saw the original steam engine made by Watt, in the great Brewery of Perkins & Co., of London. The Ex-Mayor has been wrongly informed, if he was told that *it* was the first engine made by Watt: it was no doubt made by him, but it was not the first one. The first experimental engine made by Watt, was constructed and fitted up before he went to England, at Kinneal House, Scotland, where Dr. Roebuck, his first partner, had extensive coal works rented from the Duchess of Hamilton. Watt's first engine more than fulfilled his anticipations—the only practical defect in the way of its operation being the difficulty of packing the piston steam-tight. His first engines were of tremendous size, according to their power—huge wooden walking-beams being employed; but all the essential principles embraced in a steam engine of the present day, were invented by Watt. It is only twelve years since the third engine built by him was replaced by another, after having faithfully served its day and generation. It was twelve horse power, and filled a whole three story narrow building.

The Knickerbocker says—"To the success of his engine we are indebted for the triumphs of Fulton, for the invention of the steamboat, the steamship, the locomotive,—for those revolutions in commerce, navigation, and business, which have given a new energy to the world, and dotted the wilderness with market towns. To America the triumph of Watt has proved a blessing, whose immensity even figures cannot reach."

This is a just and deserving compliment to the memory of that great and modest man. We cannot enumerate the vast changes produced in society, within the past century, by the invention of the steam engine. When James Watt rendered his engine applicable to every purpose of art, he made a present to the world of a power more economical, disposable and stupendous than all the other powers previously applied to manufactures, science and art. It was a true saying of Dr. Ure, in one of his lectures, that "the meteor flag of England would, but for his vestal fire, now have ceased to burn, and the three hundred millions expended in the Peninsular war, was the produce of the alchemy of Watt."

No country has gained more by Watt's genius than our own. He built the engine for the Clermont, the first successful steamboat of Fulton—the first which stemmed the waters of the Hudson, and linked by steam the capital of New York State with its commercial emporium. Since that time what a change has come over the face of our land; what revolutions have been produced by steam as a motive power! We employ the steam engine to dig and raise ore from the mine, to propel the ship and the rolling car, to guide the spindle and direct the loom, and apply it to a thousand other purposes. The sinews of the steam engine are coal and water; no country in the world is so blessed with such an abundance of those sinews as the United States; we may therefore conclude, that this is the land where the steam engine, in all its stupendous grandeur as a prime motor, is yet to be exhibited.

At the present moment, Great Britain, owing to her coal mines, and to her early and present efforts of mechanical genius, stands first in the rank of nations in the amount of her steam power—a power the vast extent of which no one can hardly dare to conjecture, without visiting her workshops and manufactories. America is but young in the race of manufacturing in all its branches—yet, although young, she now exhibits powers second only to her mighty parent, while at the same time she has out barely emerged from the rockings of her cradle. In the common course of events, this country will be peopled by two hundred millions of inhabitants in one hundred years hence—in 1950. With our boundless coal fields, many now sleeping untouched, and with numerous railroads then lacing the Atlantic and Pacific Oceans, we may form some conception of what our nation's steam power will then be in extent—but after all, only a conception; and then when we do so, let us not forget that the man selected by Divinity to develope this mighty power. was once an humble mechanic, but one who, like Washington among statesmen and generals, lived a life of virtue, and left behind him, as an example to all workingmen, an unstained escutcheon.

The Manufacture of Fine Glass in England.

It is not many years ago, since no fine glass was made in England—all that was used there was imported from Germany. A few capitalists determined to manufacture for themselves, and their first step was to employ German artisans, to whom they paid exceedingly high wages. The result of this has been a gradual advancement in the manufacture of English glass, and the attainment of a superiority in its manufacture, which far surpasses the German. The Frankfort *Zeitung* (a paper published in Germany,) acknowledges the fact and says, that at the coming exhibition the English will excel the far-famed Bohemian ornamental colored glass. In one department, viz. silvering glass, the English have attained a superiority over every other nation. This glass is applicable to purposes of ornament and utility, and is of great importance as reflectors for astronomical instruments, railway carriages, light-houses, and the like, for which it is peculiarly suited, from its capacity to throw back rays, and because no cleaning or polishing is ever required, more than a window pane or common tumbler. The silvering is indestructible in composition, and is coated over with glass, the vividness of whose colors, be they what they may, or however varied, are thus infinitely heightened, and the most delicate carvings upon them are so brought out as to recall the old Byzantine mosaics in their multiplicity of tints and lustrous harmony of combination.

This kind of glass is made in Berners street, London, by a process lately invented and patented by a Mr. Hale Thompson; he discards all the old methods of using essential oils, and coats all his surfaces, flat or curved, the smallest toilet bottle or largest vase, with pure silver, far more brilliantly than the amalgum applied to ordinary looking glasses, and can never be tarnished or impaired except by destroying it. The metallic radiance of this deposit imparts a combined sparkle and warmth, quite beyond the Bohemian, which is comparatively merely pretty and tinselly; and there is the important fact that British glass is far superior to anything elsewhere produced. Hence, taking quality of material, the English is on a par with Bohemian in price, and the beautiful and unique silvering is so much additional gain. The richness and purity of British crystal admit splendor and voluptuousness of dyes that satisfy the most exigent fastidiousness; hence the purple, sapphires, pinks, vermilions, pearls, bronzes, &c., in short, every chromatic hue thrown up by this new argentine reflection, have the gorgeous glow of the antique Venetian glass, the secret of which is now a lost art; but whereas the Venetian absorbed the light, and had to be held up to it before its softened beauties were revealed, the English silvered glass flashes back the light, and is seen best at night, or when surrounding objects are in camparative gloom. Another characteristic, never attempted since the discovery of glass itself by Hermes, the Syrian, is embossing—that is, to the eye, for it is an optical delusion, there being no raised surface to the touch, though the appearance is that of pure solid silver, either dead or frosted, burnished or in high relief, or sunken. It is impossible to exaggerate the results of this, applied to finger-plates for doors, enrichments of cabinets, panels, cornice mouldings, or combinations with ivory, gilding, or rare woods, to all which, and innumerable other purposes, this invention is adapted.

At these glass silvering works vases are made which are as high as $3,000 per pair, nine-tenths of the cost is incurred in designing and engraving alone. In design, English glass has made immense progress: and the goblets, epergnes, candelabra, wine coolers, &c., now referred to, are equal objects of *vertu* in classic beauty of form and of commercial importance, or suitability to the taste of the age. But, as if to exemplify the adage, that the closer to simplicity the greater the art, perhaps the *chef d'œuvres* in this manufacture are mirror globes, of plain silvered surface, all sizes, from two to thirty inches in diameter, from half a pint to forty gallons. These, placed on bronze figures, as an Atlas or eagle, attached to chandeliers, or on a sideboard or mantel piece, are a most striking appendage to drawing room or banquet hall.

We have, as Americans, done but little in the manufacture of fine and ornamental glass, but the time is approaching when we will not be behind any nation in this branch of art. At present, we import a great deal, but this will not be the case long: we have a strong evidence for making this assertion, in viewing the fine display of crystal ornamental glass vessels, displayed at the Fair of the Institute, by the Brooklyn Glass Company. Some of the articles displayed are splendid—the colors and designs are highly creditable to the company and the artisans engaged in the manufacture. We consider glass as a great civilizer, both as it respects its application to the arts, and its use for ornamental purposes. We do not know but like good roads, the amount of glass used in any country, may be taken as a proper evidence of its civilization.

Photography.

"The Poetry of Science, by Robert Hunt, published by Gould, Kendall & Lincoln, Boston."

We are right heartily glad to see this interesting work, re-published in America—it is a book that *is* a book: and here let us present some extracts, from one part of it, and throw in a few passing thoughts. Speaking of chemical changes by the solar rays, he says:—

"In the Dark Ages it was observed, for the first time, that the sun's rays turned a white compound black. Truth comes slowly upon man, the world clings to error and avoids truth, lest its light should betray their miserable follies. At length a man of genius announced that 'no substance can be exposed to the sun's rays without undergoing a chemical change,' but his words fell idly upon the ear; his friends looked upon his light-produced pictures as curious matters, and preserved them in their cabinets as curiosities, but his words were soon forgotten." This man was Niepce, of Chalons, in France—the undoubted original discoverer of photography.

"When Daguerre first published his great discovery, the European public regarded his metal tablets with feelings of wonder; we have grown accustomed to the beautiful phenomena of this art, which, if studied aright, will convince the most superficial observer that a world of wonder lies within the reach of industrious and patient research."

Mr. Hunt regards this name of "Photography" as unfortunate, and wishes that "Heliography," the name given by Niepce to the art, had been retained.

"The phenomena of the Daguerreotype involve many strange conditions. A plate of silver on which a chemical action has been established by the use of iodine, is exposed to the lenticular image in the camera obscura. If allowed to remain under the influence of the radiations for a sufficient length of time, a faithful picture of the illuminated objects is delineated on the plate, as shown by the visible decomposition and darkening of the iodized surface." In practice, however, the plate is not allowed to assume this condition, for when the common eye cannot detect any change on the plate, the artist takes it out and submits it to the vapor of mercury, and the picture appears. A polished plate of metal, glass, marble or wood, being partially exposed when presented to the action of mercurial vapor, show that a disturbance has been produced upon the portions which were illuminated, whereas no change can be detected upon those parts which were kept in the dark. "Until lately it was thought that a free chemical compound, such as iodide of silver, a free salt of gold, and one or two of lead and iron, were the only materials upon which those remarkable changes were produced, but it is not possible to expose any body to the sun's rays, without being influenced by this chemical power. The granite rock, and the brazen monument, are all acted upon destructively during the hours of sunshine, and were it not for a wonderful provision of nature, they would all soon perish. Niepce was the first to show that those bodies which underwent a change during daylight, possessed the wonderful power of restoring themselves to their original conditions during the night." It is the same with the daguerreotype plate, some means must be taken to secure its permanency—thus showing that hours of darkness are necessary to the inorganic creation, as the hours of sleep are to the organic world. Light which impresses the eye, is not necessary to the production of daguerreotype pictures, nor, as set forth by Mr. Paine, in a letter to the Scientic American, were the pictures produced by his light evidence of its brilliancy and illuminating power. Daguerreotype pictures can be produced in what would be termed "a dark room." In tropical climes the bright sunlight acts more slowly upon photographic preparations than in the less intense light of an English climate. A daguerreotype artist always failed to secure a good picture of the buildings of the city of Mexico, under the bright and cloudless skies of that clime. It is a common opinion among those not acquainted with the art, that an intense light is necessary for the production of pictures, but the skilful daguerreotypist selects a room facing the north, where it is exempt from the direct solar rays, and when a window on the sunny side is of necessity used, the light has always to be mellowed by a screen.

Maryland Mechanics Institute Fair.

Dear Sci. Am.—The Third Annual Fair of the Maryland Mechanics Institute opened on last Monday, 14th inst., in this city, in Washington Hall. Extensive and excellent arrangements have been made for the accommodation of machinery and other articles, and the convenience of visitors.

On Tuesday evening, Campbell Morfitt, Esq., of Philadelphia, author of "Applied Chemistry," and a number of other chemical works, delivered the opening address, which was, in every respect, a very appropriate one. He pointed out the objects of such associations, and the influence exercised by such exhibitions, in a very forcible manner; the audience was large, and the hearers of it were not only delighted but instructed.

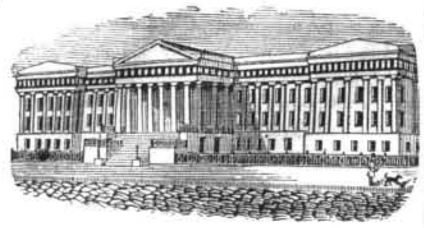
The show of articles this year is very large—more so, I think, than that of any of the two previous years. It is impossible to enumerate a tithe of them in a brief letter, much less to describe the character of any of them. Some, I have been told by exhibitors, have come from New York; and, as a general thing, the Scientific American is not a stranger to them—they speak of it in terms of the highest praise,—a number of the machines here have been illustrated in its columns, and visitors have now an opportunity of seeing with their eyes the effectual and operative value of them, not one of which, I believe, has ever been puffed or over-rated by you.

The engine which drives the machinery is from one of our manufactories, C. W. Bently & Co.'s; it works well. There are some of Messrs. Hoe & Co.'s printing presses, of your city, and a Le Row & Blodgett's "Sewing Machine," well known to your readers.

My principal object in writing to the Scientific American is to set before the public—our whole country—the success of this Institute Fair—as I am a believer in the benefits arising from such institutions, when well conducted; also to say to stranger depositors, that their machines and articles will not be overlooked. A Member.

Baltimore, Oct. 18, 1850.

[We regret that all our Philadelphia correspondents have been silent this year about the Fair of that old and respectable Institution, the Franklin Institute.—[Ed.



☞Reported expressly for the Scientific American, from the Patent Office Records.

LIST OF PATENT CLAIMS
Issued from the United States Patent Office.

FOR THE WEEK ENDING OCTOBER 15, 1850.

To John L. Allen, of New Haven, Conn., for improvement in Braces for Carriage Tops.

I claim the construction and arrangement of braces for carriage tops, so that one limb or part of the brace is turned upon a prop, fulcrum, or pivot, all the joints of such brace are simultaneously moved or operated, substantially as shown in the drawings.

I also claim the adaptation of a graduating strap, or similar device, so as to secure the top at any desired elevation, as herein set forth.

To Daniel Bartlett, Jr., of Boston, Mass., for improvement in Filtering Cocks.

I claim the combination of parts arranged, constructed, and made to operate together, substantially in the manner hereinbefore set forth, the said combination consisting of the box or case, the tubular passage way, having three discharging orifices; the turning or hollow plug, made with a discharging orifice; the central and two lateral chambers, the self-operating valves, and their stem, seats and valve-openings; the passages leading out of the bottom of the two lateral chambers, the central discharge pipe leading out of the chamber, the partitions, and the filtering medium, having wire gauze chambers, as above specified, or being used without them, as occasion may require.

To Amos H. Boyd, of Saco, Me., for improvement in Looms.

I claim the combination of the vibrating posts and springs applied to them, as arranged and adapted to the loom frame, and the operative parts with which they are connected, substantially in the manner and for the purpose of easing the web, without varying its horizontal position, as hereinbefore specified.

To Oliver R. Chase, of Boston, Mass., for improvement in machines for pulverizing sugar, (he having assigned his whole right, title and interest in said invention to Silas E. Chase, of Charlestown, Mass., & Oliver R. Chase, of Boston, aforesaid.)

I claim the combination of a rotative series of cells, a rotative series of stampers, suitable machinery for actuating the stampers, and a cylindrical mortar, when arranged and made to operate together, and to receive, pulverize and expel sugar, or other material, substantially in the manner as hereinbefore specified.

To W. B. Coates, of Big Lick, Va., for improvement in Hemp Harvesters.

I claim, first, the box which is a constant oil retainer.

Second, The combined sides and spring bottom for catching and laying the hemp, &c.

Third, I claim casting (or securing in any firm manner) choppers on a rock-shaft, with the edges chisel-shaped, and set so as to strike obliquely against the top and right edges of the teeth, where the part, N, moves by a lateral and semi-rotary motion. I employ a male and female screw-thread, as already fully described in the preceding part of these papers. I do not desire to be understood as confining myself to the screw in getting this motion, but will employ any other method most suitable to produce the desired result, and which shall be substantially the same.

To Isaac T. Grant & D. H. Viall, of Schaghticoke, N. Y., for improvement in Grain Cradles.

We claim the particular construction and arrangement of the brace rods, so as to fold down upon the fingers, each being bent in the proportionate angle, fitting their respective localities. the ends being thus bent pass through the fingers perpendicularly, and are secured by rivetting the same upon the upper side of the fingers, which shape and form given to the wire braces, forms and constructs a hinge joint and each may be turned or swayed in the direction desired, and when separated from the sneath, each wire brace is placed in the position as represented, permitting large numbers to be packed in a condensed form, in packages or braces, convenient and proper for removal, storage or transportation, substantially the same as herein set forth and described.

To Jacob Jenkins, of Andover, Mass., for improvement in Pegging Jacks.

I claim the combination of the two jaw blocks and the double spring connecting rod, as constructed and made to operate together and in connection with the other parts of the apparatus, substantially as herein above specified.

To G. K. Snow, of Boston, Mass., for improvement in machines for Folding Paper.

My combination consists of the following elements:—First, a slotted plate, table, or contrivance for receiving and supporting the sheet.

Second, Two parallel planes or plates extending at right angles from such support, and so arranged that there shall be one of the said plates on each side of the slot of the first element or support of the sheet.

Third, A striking and folding frame or plate so arranged and operated as to press the paper against the middle or other proper part of it, force it down through the slot, and between the two parallel plates; the said parallel plates operating to complete the fold, and to hold the sheet of paper during the return or retrograde movement of the striking frame or plate. And in combination therewith I claim a second striking and folding plate, arranged at right angles to the said two parallel plates, and made so to pass or operate through them or their slots, and directly after the said retrograde movement of the first one, as to press against the sheet of paper, and force it through one of the said slots, and thereby once more, or a second time, fold it.

And I claim in combination with such second combination of mechanism, a third striking and folding plate and slotted parallel folding plate, and friction rollers (two) or equivalent contrivances, the same being for supporting the twice folded sheet of paper, folding it a third time, and subsequently discharging it, which discharge taking place in consequence of the return or retrograde movement of the striking or doubling plate, as above described.

I also claim the combination of mechanism which is applied to the striking plate and its rollers or folding contrivances and used for packing the sheets; the said mechanism consisting of the stationary plan, and the spring plate or plate and its springs, or other proper equivalents, which permit the recession of the plate in proportion as the pack of sheets increases in size; the whole being arranged and made to operate together, substantially in the manner as hereinbefore specified.

To Erastus Stebbins, of Chicopee, Mass., for improvement in Molasses Gates.

I claim the arrangement of the springs, the turning shaft and their bearings at one end of the gate, and on the side of the screw or seat tube, substantially in the manner above specified, the same giving to my improved molasses faucet, several important advantages over that described in the said patent numbered 3,002.

To Wm. Watson, of Chicago, Ill., for Maize Harvesters.

I wish it to be understood that I do not limit myself merely to the various parts herein described, when combined together in a single machine, as some of these parts may be used without the others; neither do I limit myself to the precise combination of parts described in this specification, as portions of one machine may be used in connection with portions of the others, thus constituting new machines operating upon a common principle; but I claim the method substantially as herein described, of separating the ears of Indian corn from the standing stalk on which they grow.

I also claim, in combination with the gathering forks, apparatus for husking and shelling the corn, substantially as herein set forth, whereby the gathering, husking and shelling of corn are performed at a single operation.

[Will the Commissioner of Patents see to it that we get a correct list of claims every week? Was there not a patent for a re-issue and design granted, which should have accompanied *our* list?

For the Scientific American.

Ocean Steam Ships.

As the character of the steamships Atlantic and Pacific for speed may now be considered established, and classed as first rate, and as the opinion seems to prevail (originating for the most part with newspaper editors, and others not particularly well versed in the subject) that something has now been accomplished which it is impossible for the English ever to equal, much less to surpass—it might be worth while for us to look closely into the facts and ascertain whether this superiority that we claim is real or assumed. We are interested in doing this in an unprejudiced manner, because if it be real, so much the better for us, but if it be assumed we are resting on a false security, to the consciousness of which we may some day be unexpectedly awakened. Enough, however, has been done to show that these ships are superior in speed to the America, Niagara and Canada, of the Cunard line; with the Europa and Asia it is a close run, and until some voyages have been made between Liverpool and New York, direct, it will hardly be possible to say, precisely, which has the advantage. It is well known that large steamships have a considerable advantage over small ones, in consequence of their requiring less power in proportion to their tonnage for equal speed, and as the amount of this advantage is easily reduced to calculation, it would seem that before we can truly estimate the respective merits of two ships, an allowance should be made for this difference. Let us see what this would amount to in the case of the Atlantic and the Asia, the former of which is represented to be 3,000 tons burthen, and the latter 2000. Now with vessels of precisely the same model (which for the sake of comparison we must suppose to be the case) the tonnage of course will be as the cube of the dimensions, and the power required to propel them for equal speed as the square, and since the cube root of 3000 is 14·5, and of 2000 is 12·6, nearly, and the squares of 14·5 and 12·6=210·25 and 158·76, respectively, it follows that the power required for equal speed will be in the proportion of those numbers,—viz., as 1,323 to 1,000; and since the amount of power, all other things being equal, depends upon the quantity of coal that each vessel can carry, and if we describe the amount of coal or power which can be employed by the ship of 2,000 tons by the number 1,000, it follows that 1,500 will equally describe the amount of power which may be employed by the ship of 3,000 tons. But the power required for the ship of 3,000 tons, to equal the ship of 2,000 tons in speed, is only 1,323, consequently it has an excess of power in the proportion of 1,323 to 1,500, and since the speed is as the cube root of the power—the speed of the two vessels would be as the cube root of 1,323 is to the cube root of 1,500, or as 11 is to 11½, nearly, —consequently in the time which the ship of 2,000 tons makes 11 miles, the ship of 3,000 tons ought to make 11½, or, which is the same thing, ought to make a passage from port to port in 11 days, to equal the performance of 11½ days on the part of the other. Now if the Asia makes a passage in only the same time as the Atlantic, it is evident that her performance is superior, and this superiority must consist either in the model or machinery—most likely in the model, for in some respects our engineering practice is superior to theirs, working as they do at so low a pressure and with little or no expansion, and if they only adhere to that system, we shall find but little trouble in going ahead of them.

Since the commencement of steam navigation very great improvements have been made in the model of the English ships, although the engines remain pretty much the same as they were, and there is room for very great improvement in that department, if the prejudice in favor of low steam could be removed. Almost every body knows that there is a great difference in the performance of steam engines as regards the consumption of fuel, some producing four times the amount of power from the same quantity of fuel that others do, and that this difference is principally owing to the more or less effectual working of the expansive principle. But to carry out this principle to a very considerable extent requires a higher pressure of steam in the boiler than would be considered admissible in a steamship, and would also require the dimensions of the cylinders to be increased to a size inconveniently large, it is evident it must be confined within limits somewhat narrow compared with what may be accomplished in stationary engines; but still, admitting of a much more extended application than it has hitherto undergone, and the attention of engineers should be earnestly directed towards such improvements in the engines and boilers as are necessary to carry out this principle. But even with our present boilers and the pressure of steam which is now carried in American ships, a considerable amount of expansion might be obtained, and instead of cutting off, as we now do, mostly at half stroke, we might just as well use double cylinder engines and expand the steam 4 or 5 times, or by increasing the pressure in the boilers to 40 or 50 lbs., 6 or 8 times.

By increasing the expansion from 2 to 4 times, nearly 40 per. cent more power may be obtained from the same quantity of fuel, and by carrying it still further, to 6 or 8 times, 80 and 100 per cent., thus doubling the amount of power which could be employed without increasing the consumption of fuel. Assuming it possible that, all practical difficulties being removed, such an amount of expansion could be employed, let us see what increase of speed could be calculated upon to result from it. The power being doubled—that is, increased from 1 to 2—the speed will be increased in the proportion of the cube root of those numbers, which will be as 1 to 1·26, and consequently a passage which occupies 10 days would be reduced to 8; and a passage of 12 days to about 9⅔, and if it were practicable to increase the size of the vessels, a still further advantage could be obtained from that source also. If the Asia, for instance, which now, under favorable circumstances, makes a passage in 10 days, could have her power increased so as to make it in 8, why, then, a vessel of exactly the same model, but of 4,000 tons burthen, ought to make the passage in 7½ days, so that we see a considerable increase of speed might be obtained without the discovery of any new principle by only making a proper use of the knowledge we are already in possession of. Still, it does not follow that what can be done will be done immediately, for after all, these questions resolve themselves into matters of dollars and cents, and ships as large as those which are now employed, could hardly have yielded a profit to the owners at the commencement of ocean navigation, before the public confidence in this mode of transit had become established.

As this confidence increases, we shall see the system of steam navigation extend with it, both in extent and efficiency, and the present large, magnificent and fast-sailing vessels will then be superseded by others superior to them. We shall find, too, that in process of time, by further improvements in the engineering practice, and approximating the models of merchant vessels more and more to those of the best steamers, it will be found to be cheaper to employ steam, if not altogether, at all events as an auxiliary for the transportation of merchandize in preference to sailing vessels, especially in such seas as the Pacific, where calms and light winds prevail.

ENGINEER.

Brooklyn, Oct., 1850.

[In respect to the newspaper paragraphs alluded to by our correspondent, he is perfectly correct; there are but few editors who know anything at all about that term of great latitude, the "horse power" of an engine. To scientific men the speed of one vessel over another is but of little importance—the causes of the superior speed is the main object. If regular tables were kept of the speed of the piston, the fuel consumed, the pressure, together with the form of the vessels and all connected with their management, the science of steam engineering would soon be greatly advanced.