NEW YORK, AUGUST 18, 1849.

To Our Subscribers.

Four numbers more will complete the present volume of the Scientific American. We hope that our subscribers will forward their subscriptions before the last number is issued, in order that we may transfer their names in season. We also hope that each subscriber will try and get another, to extend our circulation. It is true that our circulation is the largest of any other paper of the same nature in the world, but we should have a larger circulation than we have, and we will, if each subscriber, without any expense or outlay, just takes a little trouble to introduce our paper. Although we say this, as a request, we cannot but thank our subscribers for their kindness and interest in the welfare of the Scientific American. This is now our fourth volume; steadily have we increased in circulation, and with such an increase, we have added improvement after improvement, in the character of our paper. Let any subscriber take up the 1st, 2d and 3d volumes, and compare them with the present one, and the difference will at once be perceived. We want to add still greater improvements to volume 5, and our subscribers can enable us to do this The Scientific American is allowed on all hands, to occupy the foreground of all other periodicals, in disseminating interesting and useful information, promoting the cause of science, advocating the rights of the ingenious and industrious, and in presenting good engravings and descriptions of new inventions, and illustrations of operations in the sciences and arts, and it does so in the plainest and most common sense manner. We know that business has not been very brisk this summer, but there is no man but can pay the amount of our subscription, almost at any moment. No man who has the ambition to keep up with the intelligence of the age, can be without it. All the valuable home and foreign scientific news, first finds its way into our columns. We possess the best means of obtaining the most recent information on patents, inventions and discoveries in science and art. Therefore every person who would consult his own interest should subscribe now for volume 5 of the Scientific American.

With this number we send our prospectus. Those who publish it, will be pleased to mark the advertisement, and if they fail to receive the Scientific American through some oversight, we hope that they will let us know of the same. A few mistakes of this kind have occurred with us, but none of them intentional, and we always regret when any thing of the kind does take place.

Horse Power of Engines and the Economy of working Steam Expansively.

Since the practice of working steam expansively has come into use, the problem of calculating the power of an engine has become somewhat more intricate.

When the steam was admitted during the whole stroke, the pressure on the piston was allowed to be the same as in the boiler, but to obtain the mean effective pressure when the steam acts expansively becomes a subject of calculation; after this result is obtained the process of calculating the power becomes quite simple, as heretofore.

Since it is the same for estimating the power of all engines, the results must of course be similar, hence it is not in the process, that engineers differ so much in their results.

33,000 is now universally received as a divisor in this country, consequently the disagreement must arise in the per cent loss due to escape and condensed steam, difference in the pressure in the boiler and on the piston, friction of the engine, &c.

Now if some definite per cent loss should be universally received, engineers would all agree in their results. It is customary with some of the first shops in this country, and many in Great Britain, to deduct 40 per cent or take 60 per cent from the theoretical results.

If this practice was universally observed by engineers, we should be able to obtain and establish the number of horse power required to drive all the various kinds of machinery.

The first inquiry of a purchaser is, what number of horse power is required to drive his work. Such information (if obtained from different shops) seldom agrees.

The first class engine builders in this country, have now arrived to such a degree of perfection in building engines, that there is no practical difference in the amount of power which the same sized engines are capable of transmitting, hence the crude opinion that has existed since the early history of the engine, that no two engines can be made to perform alike, or to produce the same effect, should, and ought to be entirely disregarded.

ECONOMY OF EXPANSION.

Whether the idea of working steam expansively was suggested by the fact, (which is alike discoverable by all) that the force of steam is not much, if any reduced, by passing through the cylinder, or whether it was deduced by theoretical investigation, is of little importance, but we obtain results by theory which would require a long time to be established by practice.

It is of course understood, the earlier the supply of steam is cut off, the less the mean effective pressure, hence to produce the same effect, the area of the cylinder must be proportionately larger. It will not, however, be necessary to increase the size of the boilers, but they may on the contrary be decreased as the consumption of steam is less. It would require too much space in your paper to enter into a calculation to show these relations. We will, however, give the result of a calculation showing the economy in fuel derived from expansion. It will of course be understood, that the quantity of fuel consumed, will vary as the quantity of steam expended.

We will select a cylinder 4 feet in length and 1 foot area. In the first instance, we will allow the pressure of steam in the cylinder to be the same as in the boiler, which we will suppose to be 40 pounds per square inch. After this we will cut off the supply at 3-4, 1-2 and 1-4 respectively, then the quantity of steam expended during each stroke of the piston, will be respectively 4, 3, 2 and 1 cubic feet and the effect produced from each of these quantities of steam will be 40, 38 68-100, 34 8-100 and 24 28-100 pounds. Now it is quite certain that the quantity of fuel consumed will vary as the quantity of steam produced, hence the quantity of fuel consumed will vary as the effect produced and the consumption of steam jointly, which when resolved, gives the following quantity of fuel required to produce the same effect in all the different cases. 100, 77, 58 and 41 pounds. This is 100 pounds of coal produces no greater effect when the steam does not act expansively than 41 pounds does when the steam is cut off at 1-4 of the stroke or when the piston has moved 9 inches.

The great difference in the quantity of fuel consumed is due to the difference in the pressure of the steam when it leaves the cylinder. In the first instance it left under a pressure of 40 pounds per inch, of course possessing great mechanical power which is entirely lost, when cut off at 1-4 stroke it leaves the cylinder, (according to Marriott's law, not taking into account the difference in density due to the change of temperature) under a pressure of 10 pounds. There is a limit, however, beyond which expansion cannot be carried to advantage.

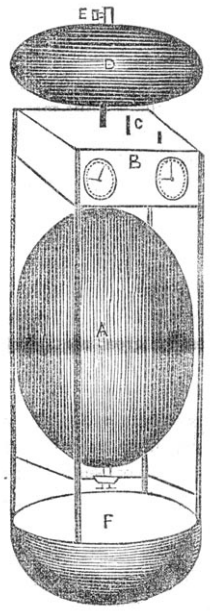
Tredgold justly remarks that the final pressure should never be less than that required to overcome the friction of the engine, for if it should be carried beyond this, there would be a moment at the end of each stroke, in which the motive power of the engine would be entirely withdrawn.

The final pressure on the non-condensing engine should not be less than 8 or 10 pounds, this would admit steam of 60 pounds to be cut off at about 1-6 of the stroke, quite early enough. With the condensing engine the final pressure may be carried as low as 3 or 4 pounds because there is a vacuum of 14 pounds to be added. Here the advantage of the condensing over the high pressure engine becomes striking. C. E. L.

New York Mechanics Institute.

This Institute has been removed from the old miserable cellar in the City Hall, to No. 105 Bowery, (between Hester and Grand sts.) where rooms have been fitted up, which for neatness and utility, greatly excel those which the Institute has hitherto occupied. The Reading Room, as formerly, will be supplied with all the newepapers and Magazines of respectability. Extensive additions to the Library are being made, and a programme of a course of interesting and instructive Lectures to be given during the approaching fall and winter, is under consideration. We hope that our mechanics will for their own credit sake resuscitate this Institution and place it upon a splendid and permanent basis. Here in a great city with nearly half a million of inhabitants, we have not been able to support a Mechanics Institute well. Our mechanics should awake to some sense of their culpable negligence in reference to their own honor. We would like if employers would give their influence in this cause. If *they* looked to the greater respectability of their apprentices and journeymen, for belonging to such an institution, the same as our merchants look upon their clerks who are members of the Mercantile Association, we would soon see a flourishing Mechanics Institute in this city.

Apparatus for Deep Sea Sounding.



A, is a copper receiver for holding condensed air. B, is an air tight box containing a lock for opening the air valves, the trigger for that purpose passing through a collar of leathers to the outside at C, and a time piece with two faces, the pointer of one face to be stopped by the mainspring of the lock, the moment the machine arrives at the bottom; and the time piece to be stopped the moment the machine is drawn back to the surface of the water. D, is a flexible receiver for holding the air in a more expanded form, to reverse the specific gravity. E, is a pipe upon which the receiver is folded during its descent to prevent the too rapid descent of the machine. F, is a piece of metal attached to the machine by four rods which slide up and down about two inches. A quantity of air is let into the receiver and the machine is then let down into the water, when the weight F, touches the bottom and the trigger C, strikes D, and stops one time piece, and then when the machine reaches the top the other time piece is stopped. Thus the one time piece would check the other in relation to the time of ascent and descent. A line does not of itself give an accurate measurement of distance from the surface after a certain depth. E. J.

Tobacco a good Protection for Hot House Plants.

In England tobacco is used to fumigate the plants in hot houses to free them from numerous amphides that are so destructive to the tender plants. The tobacco is cultivated there for that purpose and has been found to be the only safe remedy. Many smoke the leaves of household plants for this purpose.

German Silver.

This metal is composed of one part of nickel, one part of spelter or zinc, and three parts of copper; but all these substances have to be pure, and be exposed to a great heat before they mix among themselves. The zinc metal, which is of a volatile nature, is not put into the pot until after the first two metals have been well united together. The refractory nature of nickel and the difficulty of obtaining the metal free of arsenic, iron and cobalt are causes that not unfrequently we see German silver spoons of gold yellow color, while German silver prepared from pure metals, will equal in whiteness sterling silver, and will not tarnish. Tea and table spoons knives and forks, pocket combs, musical and surgical instruments, firemen's and ship captain's speaking trumpets, pocket book clasps, tea sets, lamps, and gun mountings, are now mostly made with German Silver. Upwards of 50,000 lbs. of this composition is manufactured in this country annually, for which the nickel is imported from Germany and England. There are but three localities of nickel ore in this country;—an ore from Chatham, in Connecticut, yields about three per cent nickel; another ore from the mine La Motte, in Missouri, yields about ten per cent nickel; and lately a nickel ore has been discovered among the copper ore on Lake Superior.

German silver was introduced into the United States by Dr. Feuchtwanger of New York, who was obliged to pay on his arrival in this country, the custom-house duties of silver, the inspectors not knowing any difference.—He is the first manufacturer of the German silver in the United States.

In 1837, the Doctor petitioned Congress to grant him permission of issuing $30,000 worth of pennies made of his composition, as an experiment to substitute the German silver for the copper currency; and Mr. John Quincy Adams in the House and Mr. Benton of the Senate, spoke in the highest terms of this proposition, and it met with the approbation of the President of the United States, Mr. Van Buren, and the members of both Houses. He failed, nevertheless, in that also on account of the unfavorable report from the Director of the United States Mint, who stated that the right of coinage belongs to the United States government, and that it required some skill to analyze the German silver.

Remarkable Statement about Cholera.

An eminent physician of Paris, Dr. Ronet, has written to a professional brother in Liverpool, statements so startling in reference to the results of a very simple mode of treating in the worst stage, the disease now so fatally prevalent in Paris, that we deem it our duty at once to lay it before the public. The letter, of which the following is a translation, is dated Paris June 18:—"I think it my duty to inform my professional brethren, that in a great number of patients affected with cholera in the last stage, that is to say when the pulse is absent, and in the commencement of the blue stage, I have succeeded in restoring the action of the heart and recovering the patient from the blue stage by administering at intervals of half an hour four cups of a hot and sweetened infusion of the common lime tree, mint, balm or chamomile, &c. in each of which cup of infusion were four drops of volatile alkali, making 16 drops, which the patient may take in two hours. The reaction is almost instantaneous. The pulse commences instantaneously to beat, rather irregularly at first it is true, but afterwards with force; the blue state disappears; the body, face and extremities are covered with hot and copious sweat, and in a few hours the patient is entirely out of danger. It is frequently necessary to combat the reaction when it becomes too strong, by the assistance of bleeding."

One of our Generals residing in Washington in affluent circumstances, has been wise enough to learn his well educated son a trade, and the youth, with all the true dignity of one of nature's noblemen, is wielding the axe and jack plane This is a noble novelty which merits commendation. "Give a boy a trade and you give him an estate."

Gum camphor laid in the track of ants is said to be excellent for keeping away these troublesome insects.