Correspondence

Obstructing the Hudson River.

Messrs. Editors:—I noticed on page 89, current volume of the Scientific American, an article on "Improving navigable rivers," which reminded me of a subject I thought of bringing before the public. It is to prevent sand and earth from being carried into navigable rivers, and thus keep them navigable without the necessity of employing dredging machines. The banks of rivers may be protected with walls; but this will not prevent great quantities of earth and sand from being carried into them by creeks, during freshets. Perhaps the greatest deposits of mud which find their way into rivers, are carried thither by creeks. While building a house recently, in Washington county, N. Y., I noticed a place nearly opposite Schuylerville, a short distance from the river, where millions of loads of sand had been washed away; and millions more will probably go in the same direction. On the banks of the Wyantskill (a creek which empties into the Hudson, near Troy, N. Y.), immense quantities of sand have also been washed out, lately, and carried down into the river. In several places, hills of gravel and sand, which were formerly covered with forest, or grass, have recently had their sides exposed, by cutting roads, &c., through them; and as a consequence, every rain-storm washes down large quantities of gravel and sand therefrom into the creek. Some system should be adopted for preventing such obstructions to navigation from being carried into navigable rivers.

M.

West Sandlake, N. Y., Aug. 20, 1863.

Concerning Milk.

Messrs. Editors:—In the Scientific American of Aug. 22d, I notice an article on a curious custom prevailing among the milkmen of Mexico, in driving their herds about the streets and milking them to order. When in Paris last season with an invalid friend, we had asses milk prescribed, to be taken fresh from the animal, and, early in the morning, about six o'clock, tinkling bells announcing their approach, the sleek and beautiful she-asses appeared, and the milk required was drawn before the patient's eyes. I was gratified with this method of furnishing the pure milk. It was to be seen every morning in Paris, in the most fashionable promenades as well as the ordinary streets; where pure milk could be obtained without any possibility of the adulteration which prevails in all our cities. It may not be practicable to introduce this system generally; but to the invalid, and the little ones who are now slaughtered by thousands by the vile admixtures which are furnished, what a relief it would be, if this Parisian custom could be introduced among us! I beg of you, dont discourage any effort that will give us pure milk.

[On the contrary we should be glad to see the sale of all adulterations of this prime necessity of life reduced rapidly. There is no hope for a radical reform in this respect, except in the intelligence and good sense of our citizens. Fresh, sweet, and pure country milk can be had in this city in any quantity; and those persons who drink swill milk do so from choice, and not compulsion.—Eds.

Packing for Piston and other Rods.

Messrs. Editors:—A short time since I noticed in your valuable journal an engraving of a metallic packing for piston rods, etc., the accompanying article on which expressed the great trouble to which engineers were frequently put in endeavoring to prevent the escape of steam from the stuffing boxes.

Up to March, 1862, I had experienced like difficulties. I then packed my piston rod with Martin's patent metallic packing, which remained perfectly steam tight up to the 4th of July, 1863. About the middle of March, 1862, I also packed my valve stems with this material, which lasted for six months without giving any trouble. It has also worked about the same in other engines in this vicinity.

The packing on the piston rod cost $3.30—being a fraction over 20½ cents per month. The engine is a forty horse horizontal, working at about 80 pounds pressure. Should any of your engineering correspondents have used packing of greater durability and cheapness, I should be glad to hear of it.

I have no interest in the sale of the article, but write this in the hope of lessening the trouble and anxiety of some brother engineers, and also influenced by your able and very commendable endeavors to spread, broadcast, information valuable to employers and employed: aiming alike to promote the interest and elevation of both. If you consider my testimony worthy of insertion in your journal my object will be accomplished.

The inventor and manufacturer of this packing is Richard Martin, 8 Water St., Brooklyn, L. I. I have often wondered why he does not advertise it in the Scientific American; he would certainly increase his business tenfold, if not more.

Joseph C. Eaton,
Engineer at J. S. & E. A. Abbot's Coach Manfy.
Concord, N. H., Aug. 15.

Guano Deposits on the Coast of Peru.

An important survey has lately been concluded, of guano deposits on the coast of Peru. The engineers commenced at the Lobos Islands, where, in their opinion, were the more valuable deposits. The guano on these islands extends on a large part of the surface, to a depth of ten or twelve feet; but on some parts there are deposits of as much as forty feet deep. On both islands the first-class guano may be calculated about three millions of tuns, and the one of the second-class, about one million of tuns. For the first-class guano, Peru can easily obtain a net produce of $30 a ton. Of the second-class, the net produce will not be less than $20 a ton. After these islands were explored, the Peruvian engineers sailed for the Macabi group, near Malabrigo; but on board they had such a poor opinion of these deposits, that nobody thought of staying there any longer than two days. When they landed, however, they were surprised to find a respectable stock—the whole guano of the first class, and not inferior at all to that of the Chincha islands. In the exploration of these islands, which are two, a large and a small one, the labors of the engineers were interrupted, because the borer they used for their examinations broke, after having penetrated, with great effort, to the depth of 130 feet, without touching the foundation rock. On these islands all the guano is of first quality, and the said stock is not less than 1,500,000 tons. The work having been suspended after this accident, the vessel sailed for the Guanape group, opposite the point of St. Helena. All the guano on these islands was found to be of the first class; and the stock, judging by the height and the extension of the deposits, which commence at the very sea, will not be less than 2,000,000 tons. The minimum of these deposits may be represented at 8,000,000 tons.

The Old and New Times.

How much happiness, time, and temper have been saved to mankind by the inventor of lucifer matches; and yet his name is unknown. What intolerable bores must have been the flint and steel! When the wise and witty Sydney Smith was in his seventy-third year, he amused himself by writing out a list, which will be found in his memoir, of eighteen important changes which had taken place in England. In the first place, when he was a middle-aged man, gas was unknown; and he says he has "groped about in the all but utter darkness of a twinkling oil lamp, under the protection of watchmen in their grand climacteric, and exposed to every species of degradation and insult." He was nine hours sailing from Dover to Calais; nine hours riding from Taunton to Bath; in which he says, with an exaggerative wit, "he suffered from 10,000 to 12,000 severe contusions, before stone-breaking Macadam was born." He had no umbrella when it rained; and poor Jonas Hanway, who first introduced umbrellas, was finely persecuted and mocked for his courage. There were no quick and excellent cabs running; if he wanted to go beyond walking distance, he must fain get into "one of those cottages on wheels, a hackney coach"—of which there is now only one existing in London. But those hackney coaches were themselves a modern improvement. If, in the days of the youth of the witty writer we have quoted, he travelled to certain parts of the kingdom, he went in a slow waggon, as he was poor; he must otherwise go in the basket of a stage-coach, where his clothes were rubbed all to pieces. In even the very best of society, he says, "one-third of the gentlemen were always drunk." There was besides hardly an easy chair or a well-made sofa in the kingdom. Huge bedsteads harbored vermin, badly-made windows excluded light, and ventilation was an undiscovered science. "Positively," writes the canon of St. Paul's, "I could not keep my small clothes in their proper place, for braces were unknown." If a man had the gout, there was no colchicum; when small-pox was about there was no vaccination; and people, who had lost their sight and their beauty from that scourge were met at every step. The doctors were ignorant; and, to make matters worse, there was no proper examination or restriction; consequently quacks abounded. There was no penny post, and no bank to receive the savings of the poor. "In spite of all these privations," wrote Sydney, "I lived on quietly, and am now utterly ashamed that I was not more discontented, and utterly surprised that all these changes and inventions did not occur two centuries before." In spite of all their shortcomings in comfort, the old times were often great times, producing noble and great men, who spent their lives for the good of their fellow creatures. The majority of modern improvements may be and are little things; but these "little things are dear to man." They permit him to act more freely; they are so many stumbling blocks taken out of the way of general advancement.

Chrome for Photography.

A chrome green of great beauty is prepared as follows, according to M. Guignet, the French chemist:—

Take a mixture of three parts of boracic acid and one part of bichromate of potash, calcined at a temperature of about 300°, centigrade. An evolution of water and oxygen gas is observed, and there is formed a double borate of sesquioxide of chromium and potash. This salt, which is stable at the ordinary temperature, is decomposed by water, giving biborate of potash and sesquioxide of chromium. The latter body in the nascent state combines with water and forms a hydrated sesquioxide of a remarkably fine color. This is separated from the biborate of potash by decantation and washing, and the remaining chrome green is allowed to dry at the ordinary temperature. The pigment is being largely used among artists on account of its beauty and brilliancy. The color is very solid, and it has the valuable property of looking equally beautiful by gas or candlelight as it does by daylight—the green color not changing to blue as is the case with many pigments. Sesquioxide of chromium may also be obtained in a very curious form by the decomposition of bichromate of ammonia. A quantity of crystallized chromic acid is dissolved in water and divided into two equal parts; one portion is then neutralized with ammonia, the other portion added, and the whole evaporated over oil of vitriol. When the solution becomes sufficiently strong, the bichromate of ammonia separates in the form of large cherry-red crystals, which are collected by decantation, drained on bibulous paper, and dried at a gentle heat. On exposing a small portion of this salt to the heat of a spirit lamp in a platinum dish, a very energetic action takes place, accompanied by strong incandescence, and green bulky masses of chromic oxide shoot out in every direction, exactly resembling ordinary dried green tea leaves. Sesquioxide of chromium possesses another property which renders it of interest to photographers. After it has been ignited it may be considered as being practically unaffected by any chemical reagent. It is, on this account, of the greatest value for coloring paper pulp from which legal documents are to be made. The green tint of the paper renders them incapable of being copied photographically, whilst the unalterability of the sesquioxide of chromium prevents the paper from being bleached by chemical means before taking the photograph. There is only one objection to paper tinted in this manner. The oxide of chromium is so intensely hard that it rapidly wears away the pens employed for writing on paper tinted with it.

Antidotes of Poisons.

Toxicology is one of the most delicate parts of medical chemistry; and, to analyze the contents of the stomach, or to pronounce positively whether it contains or does not contain poison, not only a considerable knowledge of chemistry, but also considerable practice in manipulation is required. But when the poison administered is known, the following list of ordinary antidotes, placed after the poisons, may be used with good results. The substances mentioned should be immediately given in solution, and the stomach pump or an emetic of white vitriol, or ipecacuanha, employed to evacuate the stomach and bring away the poison as soon as possible :—

Acid, hydrochloric (or muriatic), *nitric* (or aquafortis), *oxalic* (salt of lemons, often mistaken for Epsom salts)—Magnesia made into a paste with water; solution of soap.

Acid, hydrocyanic (or prussic)—Cold effusion of diluted ammonia.

Antimony, tartar emetic—Administer large doses of warm water to induce vomiting; give the powder of Peruvian bark, and, as soon as it can be prepared, the infusion of bark, which decomposes the tartar emetic.

Arsenic (the white oxide)—The hydrated tritoxide of iron in a dose thirty times greater than that of the poison.

Baryta (the oxide, the muriate, and the carbonate)—Sulphate of magnesia (Epsom salts), sulphate of soda (Glauber's salts), or any alkaline or earthy sulphate.

Cantharides—Emetics, if required, demulcents, leeches, and bleeding. Sir Benjamin Brodie states that, where strangury was produced by a blister, goldbeater's leaf laid on the plaster, obviated this inconvenience, without preventing the usual action of the cantharides; a fact which has been confirmed by experience.

Poisonous fungi (mushrooms)—Emetics; no antidote is known.

Sulphuretted hydrogen—Free exposure in the air.

Carbonic acid (in brewers' vats, &c.)—Fumes of burning charcoal, and free exposure in the air.

Copper.—Blue vitriol and verdigris (sulphate and acetates of copper)—White of eggs, iron filings, and ferrocyanate of potassium in solution.

Lead.—Litharge, red lead, white lead, sugar of lead, and Goulard's extract. In the first stage, or the irritant form of injury, administer sulphate of magnesia, potash or soda. The phosphate of soda is a good antidote. When palsy supervenes, the regimen must be regulated carefully.

Mercury, the bichloride (corrosive sublimate)—Give white of egg diluted in water; or milk, if eggs cannot be obtained.

Strychnia and *Nux vomica*—Evacuate the stomach with the stomach pump, or emetics. No antidote is known.

Opium, Laudanum.—Emetics of the sulphate of zinc (half a drachm, or two scruples), the stomach pump or injections of tartar emetic, must be employed to bring away the poison. The patient should be constantly roused by dragging about the floor, throwing cold water in the face, and giving ammonia, assafetida, &c. Bleeding is sometimes required.

Zinc, sulphate (white vitriol)—Potass in syrup; also cream, butter, and chalk. Give water after the antidotes.

Curiosities of the Draft.

The scenes at the Provost-Marshal's offices in Philadelphia were sometimes amusing. The *North American* says :—

"Experience shows the fact that the two infirmities most common among men in cities are hemorrhoids (piles) and rupture in its various forms. On account of these two affections, fully three-fourths of the applicants for exemption receive their discharge. Rupture is an affection that is in its very nature incurable. Its effects may be palliated, but a ruptured man could not possibly perform a soldier's duty. Very bad cases of hemorrhoids are equally disqualificatory for military service.

"In examining substitutes the most rigid scrutiny is exercised. Many attempts at fraud are made. Men unfit for service sell themselves as substitutes, foolishly supposing themselves able to conceal their infirmities. They little know the ordeal through which they must pass. They entirely overlook the fact that a surgeon, in five minutes, can overhaul them as a watchmaker overhauls a watch. There are abundant attempts at fraud all round. Drafted men claim disqualification on the ground of disability, and men who want substitute money endeavor to conceal their ailments. Both call into practice the utmost skill of the surgeon making the examination.

"The substitute, upon presenting himself for acceptance, is taken into a room, where he disrobes himself. The surgeon begins with his teeth, and examines his whole body down to his toes. The examination is even more searching than the examination of an applicant for a policy of insurance upon his life by a life insurance company's surgeon. If the front teeth are gone, so that the man cannot bite off a cartridge paper, he cannot be accepted for infantry service. He may do for a trooper. Every limb is examined. If the lungs are unsound, the temperament apoplectic, or the system wasting, the Government does not want the man, either as a volunteer, a conscript or a substitute.

"The applicant is made to throw himself into various attitudes. His toes and fingers must be practically perfect. He is made to pick up a grain of corn from the ground without bending his knees; to stand upon the points of his toes, and to show that he is perfect in his anatomy. If he stands this test he is accepted, and a release is given to the man who brings him. The substitute then receives his money, and is given into the custody of a guard. He is then a United States soldier for three years.

"A little man claimed to be ruptured. The removal of his clothing disclosed a truss with pads about as big as tea saucers, large enough to cover a first-class rupture upon the Belgian giant. The doctor could find no sign of any rupture, but as a rupture sometimes descends or recedes, the man was told to sit down for a while. In half an hour, if it existed, it would be perceptible. The man sat down, in *puris naturabilis*, upon a chair, trembling like a leaf. But the rupture didn't show itself. The surgeon said that if he could bring a respectable medical certificate of rupture existing, it should have due weight. The man left, saying he would get it. He appeared honest.

"Out of about thirty whom we thus saw examined, more than a dozen were badly ruptured: a fact which shows that dealers in trusses do a lively business. One fellow had voluntarily relinquished his front teeth to escape conscription. To his unutterable dismay he was accepted for cavalry service. When he found himself caught, his knees smote together, and his face paled to the whiteness of the paper on which the surgeon wrote his name and condition. He was in splendid health. The gums from which the sound teeth had been violently drawn had not yet receded into position. Very few colored men apply for release. When drawn, they go or else bring substitutes, and few of them do this."

Propagation of Fungi.

It is a physiological axiom that the simpler and smaller an organism, the more bountifully is it furnished with the means of propagating itself. Exposed to numerous contingencies, to extremes of temperature, to excessive drought, alternated by excessive moisture, failure of reproduction by one method must be compensated by the development of another, which shall answer the purpose in view even in the most unfavorable circumstances. Accordingly, plants of this class are provided with two, three, and, in some cases, even with four modifications of reproductive power, all equally effectual, though not all developed at one and the same time. They may multiply themselves by means of the spawn or mycelium, by self-division or lamination, which may be regarded as a species of germination or budding, or they may be propagated by seeds or their equivalents, produced in special receptacles. Every cell or tissue may contain its germs, and each germ springs up into new forms equally fitted for propagation in the space of a few hours; nay, some may pass through the course of their existence in a few minutes, and give birth to thousands even while under the field of the microscope. In truth, the common productive bodies called spores or seeds do not directly propagate the fungus. They germinate, however, at definite points, and after a time produce threads or filaments which throw out secondary and even tertiary spores, which are the true organs of reproduction, and whose minute size and greater profusion render them more serviceable in the economy of the plant.

The number of germs, or other reproductive bodies which parasitic fungi produce is incalculable, almost infinite. It has been ascertained that one grain of the black matter which fills up the ear of corn in smut, contains upwards of four millions of spores or seed-vessels, which are again filled with sporules or seeds so infinitesimally minute and impalpable, that no definite forms can be distinguished by the highest powers of the microscope. When a seed-vessel is ruptured, they are seen to escape in the form of an airy cloud, filmy as the most delicate gossamer; and on a fine summer day, a keen-sighted observer may behold them rising from diseased heads of growing grain into the air, by evaporation, like an ethereal smoke, dispersing in innumerable ways, by the attraction of the sun, by insects, by currents of wind, by electricity, or by adhesion. The atmosphere is freighted to an inconceivable extent with such germs, quick with life and ready to alight and spring up. So tenacious are they of vitality, that neither summer's heat nor winter's frost can destroy them; and they are capable of germinating after the longest periods of hybernation. Furnished with such powers of endurance and dispersion as these, it is a fortunate circumstance that they require peculiar atmospheric and other conditions for their growth; and when these are absent, they will not develope themselves or spread; otherwise the whole world would be speedily overrun with them; the "fig-tree would not blossom, and there would be no fruit on the vine; the labor of the olive would fail, and the fields would yield no meat."

Bird-catching Spider.

H. W. Bates, an English naturalist, has lately published an account of his adventures in the region of the river Amazon. The following is his account of a bird-catching spider, which he saw at Cameta, in the Province of Para :—

"The species was M. avicularia, or one very closely allied to it. The individual was nearly two inches in length of body, but the legs expanded seven inches, and the entire body and legs were covered with coarse gray and reddish hairs. I was attracted by a movement of the monster on a tree trunk; it was close beneath a deep crevice in the tree, across which was stretched a dense white web. The lower part of the web was broken, and two small birds, finches, were entangled in the pieces; they were about the size of the English siskin, and I judged the two to be male and female. One of them was quite dead; the other lay under the body of the spider not quite dead, and was smeared with the filthy liquor or saliva exuded by the monster.

"I drove away the spider and took the birds; but the second one soon died. The fact of species of Mygale sallying forth at night, mounting trees and sucking the eggs and young of humming birds, has been recorded long ago by Madame Merian and Palisot de Beauvois; but in the absence of any confirmation it has come to be discredited.

"The Mygales are quite common insects; some species make their cells under stones, others form artistic tunnels in the earth, and some build their dens in the thatch of houses. The natives call them Aranhas caranguejeiras, or crab-spiders. The hairs with which they are clothed come off when touched, and cause a peculiar and almost maddening irritation. The first specimen that I killed and prepared was handled incautiously, and I suffered terribly for three days afterward. I think this is not owing to any poisonous quality residing in the hairs, but to their being short and hard, and thus getting into the fine creases of the skin. Some Mygales are of immense size. One day I saw the children, belonging to an Indian family who collected for me, with one of these monsters secured by a cord round its waist, by which they were leading it about the house as they would a dog."

In our notice recently of Harris's Improvement in Steam Boilers, the name of the inventor should have been stated as R. S. Harris. See paper of Aug. 8, 1863.

Improved Adding Machine.

In all business transactions figures are indisputable; and as the magnitude of the operations increases, to ascertain the correct amounts of the several sums added is of the first importance; this is ordinarily done by the well-known rule, which, however, is comparatively slow (depending upon the ability of the accountant), and always tedious. In order to facilitate the adding of many numbers, machines have been invented, which, depending upon absolute mechanical motions and changes, produce the result of a sum much quicker than it could be done mentally. Such an one is herewith illustrated. It is eminently convenient, light, portable; has no machinery whatever about it, and is always accurate—the last is of course the principal feature.

It has been remarked in many cases that "figures can't lie," but experience proves that this maxim, like some others, is more trite than true. The very best accountants will, at times, commit serious errors, which result in much future trouble; but with this tablet the result can always be warranted correct, provided the directions on the machine are observed in working it. Simplifying and shortening the vexatious process of adding sums, will be, or should be, welcomed cordially by all persons who have occasion to use figures; and the adoption of this adding tablet will tend materially to the result set forth. Very many eminent business firms in this city and elsewhere testify to its usefulness, and acknowledge the value of it in economizing time. The apparatus itself is merely a handsomely finished wooden tablet, as shown in Fig. 1, having brass slides, A, let into grooves in its face. These slides have small holes in them, opposite the numerals on the tablet itself, in which a pencil is to be inserted for the purpose of moving the slide back and forth to perform the operation. On the back of these strips there is another set of figures, which can be read through the countersunk holes, C (Figs. 2 and 3); small spring, *a*, under the slide keeps it snugly against the metallic cap, B, on either end of the tablet, so that the slides cannot move spontaneously, or at any time except at the will of the operator.

This is, in brief, the whole machine, and it will be easily seen that it comprises the features most desirable in such an apparatus; being readily operated by any one, having no complicated parts to disarrange, and afforded at a low price. These qualities, together with its accuracy, should render it one of the most popular inventions of this class. Patented through the Scientific American Patent Agency, on July 14, 1863, by Mr. George B. Fowler. Further information can be had by addressing G. B. Fowler & Co., Box 3,213, Chicago, Ill., or George B. Fowler at Rice & Co.'s, 37 Park Row, New York.

Fig. 1

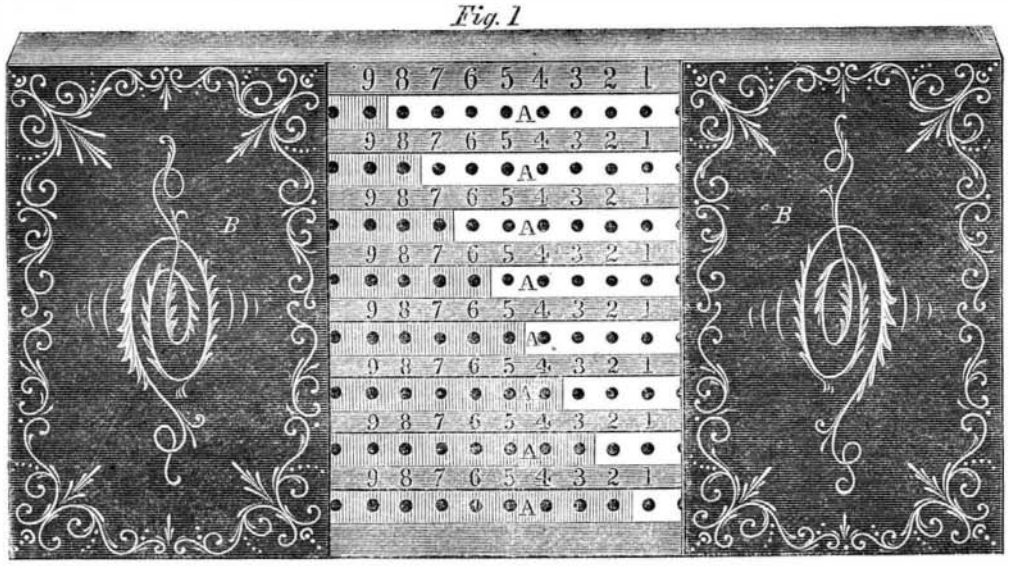


Fig. 2

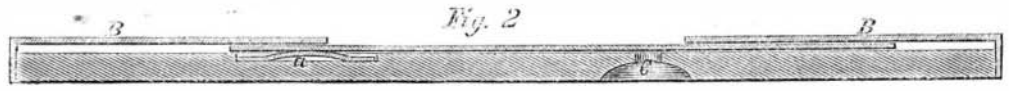
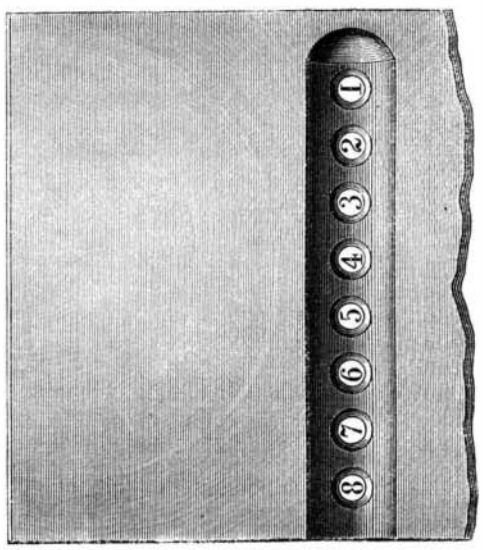


Fig. 3



FOWLER'S PATENT ADDING MACHINE.

JOINTED STEAMSHIPS.—Experiments have been recently made in England with a new iron steamship, built in sections and connected by strong working joints. Any one of these sections can be disconnected from the other, and when so separated can be left at any point and loaded, while the rest of the vessel goes after cargo at a distant point. The experiments are said to be a success; but it is a puzzle to us to see how the section containing the machinery preserves its stability when disconnected from the rest. Similar boats are used on our canals, to convey coal to and from the large cities; but we never heard of any steamships built in this manner, nor do we see the utility of them. It is stated that, tried in a sea way, the plan worked well, and the *Illustrated News* has an engraving representing this kind of ship straddling the waves in the most terrific manner.

INGERSOLL'S PATENT FRICTION WRENCH.

For drilling holes in massive castings, in work which cannot be moved under a drilling machine, or

for perforating plates in places almost inaccessible, there is no tool more useful than the common pall wrench. This is to be found in every machine shop, in all stages of worth and worthlessness; from the old worn out affair with three teeth and no spring, to the brand new one, so stiff that it takes a man's strength to pull it around. We have inspected a great many different sorts of pall wrenches in our time, some of which have been improvements upon the old style commonly used, while others have not. The wrench illustrated in the accompanying engraving commends itself to us, especially by reason of its simplicity, its efficiency and durability; all cardinal virtues in a tool of this class, that has to encounter so much rough usage. In the ordinary wrench it is well known that the handle must move a certain distance, far enough to take one tooth, before the drill can be turned, and that in some situations this feature becomes a serious objection—the longer the handle the greater the difficulty. Particularly in drilling large holes is this trouble manifested; for then the handle must be shortened, and the power of the lever is lost. This wrench is liable to no such objection, and the drill can be moved any distance required, either a portion, or half of its revolution, as may be necessary. This assertion will be fully understood by referring to the description of the tool. The socket, A, has a bevelled flange, B, turned on its exterior, to which is accurately fitted, at a certain angle, the cup, C; the upper part of this cup which is broken out to show the interior, has an inclined plane, D, worked on it, and is further furnished with the shoulder, E. The handle of the wrench is in all respects a counterpart of the upper end of the cup, and fits it as a coupling does a clutch. In the upper end of the drill socket, which is continued through the wrench, there is a thread cut which is fitted with a nut, F; this nut has a round shoulder which sets up against the handle, and regulates the bite of the cup against the bevelled flange. The object of the screw, G, is to feed the drill up to its work. It will be seen that, by turning the handle, the cup is forced by the inclined plane hard down upon the drill socket, and consequently turns the drill; on the return the handle runs upon the plane, releases the cup, and lets it turn freely, so as to renew the stroke; this operation is kept up until the hole is finished. The small channel, *a*, in the flange, allows any dirt or grit that may work in, to be thrown out; so that the friction surfaces may be at all times clean and in good order for work; there are three of these channels. The advantages of this wrench are many, and apparent to all who have occasion to use it. It cannot get out of order with decent usage, can be made as strong as required, takes up very little room on the work—much less than the ordinary wrench—and is perfectly noiseless. This last feature is an extraordinary one. If it proves on trial all it appears to be in the office, it will be one of the best wrenches we have ever seen; the principle is certainly a good one. Patented by S. Ingersoll, May 12, 1863; for further information address the manufacturers, Betts & Ingersoll, Stamford, Conn.