

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL AND OTHER IMPROVEMENTS.

VOLUME VIII.]

NEW-YORK, AUGUST 20, 1853.

[NUMBER 49.

Scientific American,

PUBLISHED WEEKLY At 128 Fulton street, N. Y., (Sun Buildings), BY MUNN & COMPANY. BY MUNN & COMPANY. Hotchkiss & Co., Boston. Dexter & Bro., New York City. Stokes & Bro., Philadelphia. Le Count & Strong, San Francisco, Cal. Gooke, Kinney & Co. B. Dawson, Montreal, O. E. M. Boullemet, Mobile, Ala. E. W. Wiley, New Orleans, La. E. G. Fuller, Halifar, N. S. M. M. Gardissal & Co., Paris. Avery Bellford & Co., London. Responsible Agents may also be found in all the principal cities and towns in the United States. Terms-\$2 a-year-\$1 in advance and the remain der in 6 menths.

Method of Detecting Counterfeit Silver Coin.

If a piece of silver be dipped into a solution of chromate of potash, decomposed by sulphuric acid, (thirty-two parts by weight of water, three of chromate of potash, and four of sulphuric acid), the parts of the silver immersed in the solution quickly assume a purple colour. The colouring is deeper and more lively when the silver is quite pure, and diminishes in proportion to the quantity of alloy mixed with it. Of course this process will not hold good when a coating of silver has been deposited on a piece of white metal, &c. ; in such cases as plated or electrotyped articles, for instance, a portion of the coating must be filed off; upon trial by this process, the German silver will remain of a white color. No other metals give the same color as silver when submitted to this test; copper, zinc, &c., are acted upon by the solution, but not colored as in the case of silver.

Sugar of Milk for Invalids.

A short time ago Dr. Turnbull, of Liverpool, read to the Literary and Philosophical Society a paper on the use of sugar of milk as an article of food in consumption and other pulmonary diseases. It now appears that whey is coming into extensive use in Germany in the treatment not only of consumption, but also of gout and rheumatism, and that some German physicians entertain opinions as to the beneficial properties of sugar of milk (the ingredient to which whey owes its virtues) similar to those lately put forth by Dr. Turnbull. In the cheese dairies of this country the whey is frequently given to pigs, or otherwise wasted, and the lactine, or sugar of milk, now met with in commerce, is brought entirely from Europe, being prepared chiefly in Switzerland. Its present high price is, however, a great obstacle to its general use as a dietetic remedy; but it is most desirable that so valuable an article of food should no longer be wasted, and that therefore the attention of those engaged in making cheese should be directed to the manufacture of this other product from milk, which must sooner or later become an important article of food and of commerce.

Factory Labor in Rhode Island.

The recent passage of an act by the Rhode Island Legislature, making ten hours a legal day's work, is creating considerable disturb-



The iron interests of our country are of great and rapidly increasing importance. All information, therefore, relating to improvements,

small and great, in the manufacture of iron, is of no small consequence. The iron deposits of our country are on a scale commensurate with its vast extent, and the coal and wood to reduce the ores to metal, are more liberally supplied by the hand of nature than in any other country on the face of this terrestrial ball. The United States of America, are destined to be the greatest iron manufacturing countries in the world, and it is perhaps a great shame to us that they are not so at present. Be that as it may, however, no one can doubt, who is at all acquainted with both the resources and wants of our country. that the day to carry off the heated air from the refinery. is not far distant when it will be what it now should be.

of Bilson, Stafford, in England, an experienced iron maker. They consist, first, of the application of a cooling current of water to a water space, encircling the heated mass in the puddling furnace, to keep cool the materials of which the furnace is composed, and comparatively uninjured during the time it is in operation. Second, the combination of the refining with the puddling furnace by ducts passing between the two, so that the refined metal may flow directly from the chamber on to the puddling hearth, dispensing with the loss of time by removal, &c. Third, connecting the refinery furnace flue with a chimney,

The annexed engravings are views of im- the waste heat of the refinery, and make it provements in iron furnaces by Joseph Jones, available for generating steam for driving an engine.

> Figure 1 is a a plan view; fig. 2 is a longitudinal elevation of two furnaces combined together and fitted up on these principles, with the refinery attached. Fig. 3 is a corresponding vertical section of the same.

The water is conducted to the furnace shell by the vertical pipes, A A, fig. 3, which are in communication with a water reservoir conveniently situated for that purpose. The water enters in a cold state into the water space, B, at the back of the flue jamb plates, C, as well as into the water space, D, behind the bridge jamb plates, E. From the space, B, the water passes into the water space, F, between Fourth, carrying a flue from the refining fur- the flue bridge plates, thence into space, G, set naces into the flues of a stream boiler to use near the back wall plate of the furnace, and





ance among the manufacturing villages of that is finally discharged into the tank, H, under on two opposite sides in the usual way; and ing recesses cast on the main frame plates, a eing put th the bottom plates of the furnace. The water | as the metal is melted and refined, it is ru supplied to the space, D, passes to the space, out direct into the two puddling furnaces by | each case, to bind the whole together. The I, between the fire-bridge plates, and thence the inclined pipes or ducts, M M. In this way | combination of the refining with an elevated into the space, J, near the back wall plates of the metal is at once conveyed to the puddling stalk is not represented; neither is the mode the furnace. After passing through this hearths without any additional trouble. 'The of conveying the excess of heat and applying course, the heated current is finally received two puddling furnaces are of the usual reverit to a steam boiler; these arrangements and as before, by the bottom tank, H. By this berating kind, and their grates, N, are supappendages will be easily understood. The contrivance the whole of the parts exposed to plied with coals in the usual manner, the iron application of the waste heated products from smelting furnaces has been applied to the intense heat of the puddling process, are being worked through a side opening, governsteam boilers for a long time, at some of the effectually kept cool, as the passing current of ed by a balanced sliding door, O. The flues water surrounds every part of the containing from both furnaces pass into the central or insmelting works in Wales and in Germany, shell, and carries off the excess heat, and the termediate chimney, P, carried on cast-iron whether many of our iron manufacturing eswarm water can be used as the feed water for | framing. The entire furnace is encased in | tablishments use them or not we do not know massive iron plates stayed together across the the steam engine, or for other purposes. The -no one that we have visited do so. By the refinery into which the raw pig iron is put in top transversely by tension rods; the fixed arrangements and construction of furnaces reon scientific subjects. In chemistry he has a broken state for melting, is at K. It is sup- guide piece, Q, for operating the door is cast presented, the exposed parts of the furnace are plied with air blown thrown the tuyeres, L, with side lugs, R, which fit into correspond- prevented from being rapidly injured by the

State. Upon the day on which the law went into operation many of the factories were closed the proprietors not being willing to have the law obeyed. A convention of manufacturers has since been held at Providence, and it was decided by them that the operatives should bargain to labor nine hours on Saturdays, and twelve hours during the other working days of the week, or they should not give them employment.

Prof. Silliman, Sen., has resigned his situation in Yale College. His son has been appointed to succeed him. Prof. Silliman has long been a distinguished teacher and writer long held a high place.

intense heat of the puddling process. The im- | working which they have introduced, has led | any reduction in the wages of the workmen provement has been patented in England, and the "Glasgow Practical Mechanics' Journal," after the plans."

which illustrates it, speaks of it in very complimentary terms. It says, "these improvements have been in the MonklandsImon Company's Work, in Scotland; for the welve is conducted with ability and skill. We hope fore, that our country will soon become the months, and the great economy and ease of that such prices will soon be reduced without greatest, iron manufacturing country in the

386

other iron companies to make eager inquiries or fair profits to the manufacturers. The reason why we entertain such a feeling is, that we Owing to the high prices of iron which believe the progress, prosperity, and happiness have prevailed for some time, its manufacture of the people depends greatly on the extenhas now become very remunerating when it sive use of iron. It is our great desire there-



world, and that its manufacture may be so its more extensive use. Every improvement | manufacturing iron is hailed by us as a mean improved as to reduce its price and allow of in the machinery, furnaces, and processes for of benefitting our fellow men.

YSTAL PALACE

GENERAL REMARKS-The progress of improvements in the Palace, during the past week, has been quite rapid and visible from day to day; in many quarters of the building the permanent arrangement of the articles is made; especially the Agricultural Department has an air of completeness. The Machine Arcade and Fine Art Gallery will be ready for the reception of their treasures in a few davs.

The Exhibition will realize all the reason able anticipations that have been formed of it. It will be a tolerable exposition of the indus trial resources of the world. If the Palace and its contents could be buried out of sight. till some Layard and Champollion of the three thousandth century should dig it up, our descendants of that late day would find enough in the fossil display to satisfy their most eager

considerably larger than the plate. But if the ciated ? We are persuaded that they might for distributing the pamphlets describing the looks very well-promises to be the right large plates be carefully moved about on the have made one of the most attractive and inmagical and all-healing properties of some of thing. We expected to find it a valuable top of the bath during the bringing-out prostructive displays in the Palace. We expect them. Supposing the wise Directors had guide in our wandering, but we soon found cess, we should think the edge might be coatsoon to meet the ingenious professor, Carling, made no narrow restrictions in this branch of that we could not rely upon it. Whose fault ed the same as the center portions. industry, we wandered on expecting to bethe skillful fancy glass-worker, who has seis it that many numbers of the catalogue do cured a place in the Palace for the exhibition not correspond with the numbers on the artihold a gorgeous display of sticking plasters PHOTOGRAPHS-Everard Blanquart, of Lille, of his wonderful art. The Brooklyn Flint cles-and that many of the articles are not exhibits "Photographic Illustrations of Vaand pills-a mammoth pill-a sixty-four Glass Co... to whom was awarded the prize ticketed at all? We heard some bitter compounder, say-all beautifully gilded, or a pill rious Subjects," in the French Department. equestrian statue of General Washington or medal at the London World's Fair, exhibit an plaints from gentlemen who came to study These we have not seen, but they are highly Daniel Webster. We presume the Directors assortment of their ware. Plate glass is exand to learn. But there is to be a new edispoken of. In the American Department, hibited only in the few splendid mirrors which Whipple, of Boston, exhibits "Crystallo. rejected such articles. What narrow views tion of the catalogue and all will be right, they adorn various parts of the building. There is of things they must take? M. A. Root, of Philadelphia, "Tal ypes;" a small display of crown glass from Holland, BARLOW'S PLANETARIUM. --- Conspicuous botypes," and Hawkins, of Cincinnati, "Solo-GLASS-Glass working is one of the oldest -and in the United States Department a few among the objects of scientific interest is an graphs." These pictures are produced by of the arts. It is alluded to in the Old boxes from the Baltimore Glass Co. Perhaps improved Planetarium, the invention of Thos. substantially the same process. Ample in- Testament, and was one of the unexpected the 25,000 square feet inclosing the Palace it-H. Barlow, of Lexington, Ky. The peculiarstructions in the art have been published in things discovered by Layard in his exploraself, is sufficient to show what may be done in ities of this Planetarium are the amazing inthe Scientific American during the last four tions about Nineveh. this line. Bohemian glass, celebrated for its genuity and perfection of the machinery by or five years. We are surprised that so little Some of the finest specimens of stained glass heat-enduring properties, and the beauty of its which the motion, position, and phases of the are the product of the Middle Ages. But it is attention has been paid to this beautiful art ornamentation, is exhibited in the Austrian planets for all time-past and to come-are only within about a hundred years that glass in the United States. On the Continent of and German Departments. shown. Difficult and tedious problems may has been afforded cheap enough to be used by Europe Photographs are preferred to Daguerbe solved by a few turns of the machinery all. Before this time it was a luxury or an We wanted to see the workmen's tools and reotypes, and in some cities of Germany Dawith a surprising accuracy. There is no other ornament. Among the ancients it was a costspecimens of the ware in the different stages guerreotypes are almost obsolete. The chief single piece of astronomical apparatus which ly rarity, so that a glass cup was a princely of the manufacture-bottles and tumblers half advantages of Photographs are, that they may formed, and the huge cylinders and globes can so readily illustrate and demonstrate so be easily and cheaply copied, and that there fortune, and descended from generation to gemany interesting facts of the sublime science. is no disagreeable metallic reflection as in neration as an heirloom. Glass was the symfrom which window panes are cut. Such a display as this would be eminently curious DAGUERREOTYPES-It is generally under-Daguerreotypes. The cost of a single pic- bol of brilliancy and splendor with their ture is greater than for a Daguerreotype, but poets. and instructive to most of the visitors. stood that the best daguerreotypes are produ-

ced in the United States : the fame of our operators is world-wide. Orders for American apparatus and American processes are received from all parts of the globe. Even in Paris, the birth-place of the Art, the most extensive and splendid establishment is called "The American Photographic Saloon." The competition on daguerreotypes at the Palace is entirely among our own artists. The number of exhibitors is about forty-all Americans, we believe. The collection of pictures is very extensive, embracing specimens of all the various processes-such as crayon, illumi- have never heard of such a thing. The nated, colored, &c. Probably the best daguerreotypes in the world may be found here; and there are many pictures which verify all the extravagancies of those who first described the Daguerrean Art. The beauty and Lantern Exhibitions. Bommer & Rolle, 247 reality of many of these pictures leave nothing more to be desired. Hillotype, even if there were no "stick in the vellow," will be in little demand if operators generally can learn to color with the exquisite taste and skill dis-

when many copies are wanted, they may be afforded at a comparatively small sum. The pictures are bolder and more distinct than Daguerreotypes and may be viewed in any light. Being on paper they may be colored with great facility.

The pictures on exhibition are not the bes specimens of the art; some of those we observed are spotted and uneven in tone. But the exhibitors will have the credit of being pioneers of Photography in America. They will introduce it favorably to thousands who Messrs. Langenheim, of Philadelphia, were the first to make it a business; their pictures are called "Hyalotypes," and have been exhibited in many parts of the Union in Magic Broadway, are exclusively engaged in the business of Photography, and are preparing some pictures for the Crystal Palace, which will excel anything now on exhibition.

curiosity about the olden time. There is a QUACKERY-In the American Department played in the pictures of Gurney and others. glass ware. The chief competitors are France, great deal at the Palace to be seen, and much (where else could we expect it ?) we found There are good pictures by all the exhibitors, worthy of careful study ;-less than a whole the United States, and Austria. The amount some very notable contributions to the "Exday's visit should not be thought ot. Upon but the palm will be borne away by our exhibited is not at all commensurate with the hibition of the Industry of all Nations ;" the New York artists. Some of the country genimportance and condition of the art. About the whole the Exhibition is quite a creditable names alone, we think, should suggest to our tlemen evidently did not know the men they New York City alone there are eleven factoaffair, especially in view of its being an exreaders, certainly to those who take a country ries; in many parts of the United States the were to contend with. One of the creditable temporaneous and private speculation. In an newspaper, or were ever in a flash barber specimens, worthy of attention, is a panoramaterials for the manufacture are found in the enterprise so large, lapses and imperfections shop, all the needful comments. We took mic view of Cincinnati, Ohio, from Newport, greatest purity and abundance. Considering that cannot easily be anticipated will of course down some of the big words : here they are by A. Bisbee, of Dayton, Ohio, on six extra the high and deserved reputation of the New occur. Constant vigilance of managers is expec--" Italian Colornerus," " Chemical Cathailarge plates. Mr. Bisbee has well met the England Glass Company, their display is quite ted and required, and if abuses are not speedily ron," "West Indian Tincture and Abification difficulties of the bold experiment, but he meagre and unsatisfactory; they have presentcorrected, censures and complaints must come. Tooth Powder," " Clierhugh's Tricopherous,' should have been more careful in the mercu-" Improved Wahpene," " Anti-Scorbutic Soar ed, perhaps, some of the best specimens of We desire to speak as we have hitherto,rialization. It is extremely difficult, but not their skill; but why not more? And why Wash," "Rose Bandoline," "Great National whether in praise or reproach, plainly, freely, impossible to mercurialize a large plate evendid not they arrange their wares in better and impartially. Instantaneous Liquid Hair Dye," " Oleoly. The top of the bath should always be phane," &c. &c. The locality is also a depot taste, so that they would be seen and appre-THE OFFICIAL CATALOGUE-The Catalogue

Its chemical constitution was not understood till the time of Berzelius "the father of chemistry." It was chiefly by his researches that the theory of glass making was made plain. Glass is now classed with the salts. The acid is silicic acid (sand or flint), and the base is one or more of the alkalies, alkaline earths, or metallic oxydes. Glass is then a silicate of soda, potash, &c. The peculiar properties of any kind of glass will depend, of course, upon the base selected, and experience has determined what base must be used for each property. Potash or soda, or both, is the base of all common glass. Lime increases the hardness; alumina the difficulty of fusion; oxyde of lead renders it much more fusible, and adds greatly to the brilliancy and softness.

Glass is colored or stained by the addition of metallic oxydes. The most brilliant but costly colors are a topaz yellow, produced by the oxyde of uranium, and the ruby red by the oxyde of gold. Oxyde of chromium gives a green; oxyde of cobalt, blue, arsenic, white, &c. The ruby red color is generally only superficial. A mass of colorless glass is dipped into the melted color, and becomes coated or plated with it. When brought into the desirable shape by the workmen,-the cup, or whatever it is, appears to be uniformly colored throughout. By engraving or cutting away the colored film, the vessel may be splendidly ornamented.

Next to iron glass the most important material used in the arts. There is no substance which could supply its place. To the chemist, particularly it is indispensable, and there is no civilized man who would not be much embarrassed on being deprived of its use. In a World's Fair, then, this branch of industry should take a very prominent place. We should expect contributions from all the nations where the article is manufactured.

At the Crystal Palace the show of glass, in respect to quality, is very commendable. The coloring and ornamentation are splendid. Nothing but genius and taste of the highest order could have fashioned and engraved those beautiful vases, bottles, and cups, exhibited in the French and American Departments. Glass staining is not a lost art, as the "fogies" tried to prove to us a few years since. Indeed, we believe the Exhibition will show that there are no lost arts. We were tolerably satisfied with the quality but not with the quantity of

On the Manufacture of Cast-Steel, by Dr. Karsten. (Concluded from page 187.)

Although in the case of pig iron it is necessary to bring it into a liquid state, in order to convert the gray and soft variety into that which is white and hard, or, on the contrary, the former into the latter by rapid or slow cooling of the metal, in the case of iron with a smaller per centage of carbon or steel, mere rapid or slow cooling, without any previous alteration of the state of aggregation, is sufficient to convert the darker colored soft steel, into the whiter hard steel, and the reverse. Judging from analogy, therefore, it is highly probable that the changes in the state of combination of the carbon and iron take place in the hardening and softening of steel, corresponding to the different states of combination of this element in gray and white iron, although these differences in the state of combination have not yet been proved by chemical evidence to exist in the case of steel as they have in raw iron. However, the hard and soft steels have never been regarded as special varieties, and there is no greater reason for regarding white and gray pig iron as special varieties, because the differences in color, hardness, and tenacity are owing solely to the respective states of combination determined by conditions of temperature, and not to any alteration in the combining proportions. If however, gray and white iron are regarded as special varieties, in the same manner as graphite and diamond, it must not be forgotten that a perfectly analogous relation exists between hard and soft steels, which are not regarded as special varieties.

In the processes employed for decarbonizing pig iron and converting it into steel, it has not hitherto been possible to obtain a product of perfectly homogeneous nature. It is always necessary to sort the steel, in order to separate the harder parts containing more carbon from the softer, and these again from the steel-like iron. This absence of homogeneity in the product, resulting from the imperfection of the processes, led to an attempt to give the steel great uniformity of texture by melting. The so called cast steel is really a much more homogeneous and trustworthy product than the raw steel, or that obtained by cementation, although its characters likewise depend upon the proper and careful selection of the material from which it is made. In consequence of the fact, that steel may be prepared by tusion, which, together with a large per centage of carbon and consequent hardness, possesses homogeneity whatever may be the degree of hardness desired, cast steel has acquired such a well-merited reputation, that it is now always employed for articles in which great hardness is indispensable. However perfect the process for making cast-steel may appear to be, it is still open to the disadvantage, that the selection of the suitable material must be entrusted to the judgment of the workman, and consequently that however homogeneous the product, the per-centage of carbon, the hardness and solidity of the steel cannot be determined with precision beforehand. Such imperfections in the practice of metallurgical operations are in every case unavoidable, when determinations of weight must be replaced by the practised eve of the workman. The per centage of carbon in the material employed in making cast-steel-cementation-steel-is different in every part of the section of the bars, so that the average per centage of carbon in the charge of a crucible and the product of the casting cannot be determined with precision. Although the

which is made in Germany trom the pure spathic and brown iron ores, may very safely be assumed as 0.25 on the average. The

above pig iron and this bar iron are the purest kinds known, containing only traces of silicon. from which likewise the cementation steel used for making cast steel is never free. Both these kinds of iron are therefore of such a nature as to enable the operator to determine beforehand with precision the per centage of carbon in a crucible-charge, and to produce cast-steel of any desired degree of hardness by means of a simple calculation of the requisite proportion of the two kinds of raw material. If the per centage of carbon in the melted product obtained in this way, and the characters dependent upon that per centage, should be found to agree perfectly with calculation-a question to be determined only by experiments on a large scale-it might be expected that the production of cast steel from these materials would constitute a new phase ot this branch of industry in Germany; for besides the trustworthiness of the operation. by which cast-steel could be made of any desired degree of hardness and tenacity, it possesses economical advantages in the cheapness of the raw material.

But the production of cast-steel by melting together white iron and pure bar iron appeared to be liable to an objection far greater than that founded upon the impurity of the raw material, and this arose from the doubt as to whether the product of the fusion would be homogeneous. However, the question ot practicability could only be decided by direct experiment. Such experiments were made in the years 1846 and 1847.

The melting crucibles employed were of such capacity, that from 30 to 35 lbs. could be melted at a time. The melted metal was as usual run off into cast-iron moulds. The following is a brief statement of the results obtained in a great number of meltings, and the subsequent treatment of the cast-steel :---

1. In the selection of the pig iron, it is of great importance to employ such as presents perfect lamellar structure, and not such as is partly fibrous or compact. The use of lamellar iron is necessary, and not only in order that the per centage of carbon in the charge may be calculated with accuracy, which cannot be done with fibrous or compact iron in which the per centage of carbon varies greatly, but likewise and especially because the lamellar iron exercises the greatest solvent action upon the bar iron, so that even a comparatively much larger quantity of these kinds is but an imperfect substitute for the lamellar iron. Consequently good caststeel cannot be produced in this way without lamellar pig iron.

2. The extremely high temperature which bar iron requires for fusion appeared to render it necessary that it should be added to the charge in small fragments. On this account the first fusions were made with bar iron. which had been rolled into moderately thick sheets and then cut into pieces. However, it was subsequently ascertained that the solution of the bar iron in the liquid pig iron takes place without any difficulty, and that the product is equally good when thick pieces are used, so that finally masses of a cubic inch in dimension were employed. By this means the expense of cutting the bar iron is obviated; at the same time the iron is less oxidized, and less room is taken up in the crucible, than when it is in small fragments.

3. In order to produce a homogeneous caststeel, the highest possible temperature is necessary for the lusion. Consequently very hardness of the English and good German infusible crucibles, which are not liable to cast-steel correspond tolerably well with crack, are a much greater desideratum in the that which is required, this result is solely atproduction of cast-steel from pig and bar iron, tributable to the perfect acquaintance of the than even in the melting of steel itself. Of workmen with their materials, and their carecourse the greater the number of meltings gether lost. tul selection of it for this practical purpose .which can be made in one crucible, the great-There would be no uncertainty as to the reer is the economical advantage gained. sult, if we possessed a material applicable to 4. The melted metal must be run off into the preparation of cast-steel, in which the per the cast-iron moulds as rapidly as possible, mediately a small ice fixture in my cellar for centage of carbon could be calculated. The in order that the whole mass may cool uniwhite pig iron made from pure spathic and formly. At the same time care must be tabrown iron ores free from disseminated copken that none of the slag is allowed to pass plank flooring; it is pretty dry. I would preper pyrites, and the per centage of carbon in from the crucible into the moulds, for there is fer placing it in the north corner. Here is which may, without any considerable error, not time for the slag to separate from the mebe assumed as 5.6, is a material of this detal; it solidifies in the midst of the steel and lar corner floor 81 feet square; within this scription. The per centage of carbon in the renders the casting defective, and causes the space stud up a room 6 feet 2 inches, with 4 hours. One Alex. Steel pegged 82 pairs, J. best kinds of Swedish bar iron, and the iron bar to rend in rolling. This may be most ad. inch joist and board up upon the inside. This Bunker, the challenger, 78 pairs-beat by 4.

vantageously obviated by taking the cover from the crucible while it is still in the furnace, and skimming off the slag with a ladleshaped iron. The small quantity which then remains may easily be kept back in the ordinary way during the casting.

5. The cast-steel, when allowed to cool slowly in the crucible, loses all coherence, and breaks down under the hammer or rollers. The cause of this appears to lie in the formation of carburets of iron, which do not remain combined with the rest of the steel containing less carbon.

6. The cast bars must, after they have cooled, be freed from all adhering granules of metal by means of a chisel. If this is neglected, the edges of the bars become broken in rolling.

7. In heating the cleaned bars for the purpose of further working, a bright red heat must be employed. This cannot be effected in a satisfactory manner before a blast, because the temperature is not sufficiently uniform, and a uniform heat is indispensably necessary for the favorable result of the rolling or hammering. This can only be effected in a well constructed reverberatory furnace, and most advantageously in one fed with gas, a slight excess of which is present.

8. It is preferable to roll the heated bars rather than to hammer them; but if a hammer is used it must be of considerable weight.

9. The cast bars presented a perfectly homogeneous appearance, even after rolling.-The bars were first rolled out square to a length of 4 feet, and then, after reheating brought into the desired form. They admitted of being rolled into the thinnest sheets without cracking at the edges.

10. Even in making soft steel, for which purpose the crucible was charged with 25 lbs. of bar iron, and 2 lbs. of pig iron, a perfect solution of the bar iron was effected by means of a strong heat. The product was a homogeneous steel, although, according to calculation. it could not contain more than 0.6 per cent of carbon. The best, hardest and most tenacious steel was obtained by fusing mixtures in which the calculated per centage of carbon was 1.5 or 1.6. For this purpose the crucible was charged with 24 or 25 lbs. of bar iron and 8 lbs. of pig iron.

11. The cast-steel, even that which is soft and in which the per centage of carbon is only 0.6, differs essentially from the raw or melted steel from the circumstance that it cannot be welded without great difficulty. With a higher per centage of carbon it can only be welded under a coating of borax. With a per centage of 1.25, it can no longer be welded at all. Although, on the one hand, this behavior of the cast-steel obtained in this way indicates its homogeneity, still, it is a defect, one indeed which is likewise possessed by the English cast-steel in a somewhat less degree.

12. The cast steel bears only low tempering heat, and acquires a very high degree of hardness, although at the cost of its tenacity. The proper mode of tempering it still remains to be ascertained.

The steel may be used for making the finest kinds of cutlery for files and chisels. For all purposes in which it is submitted to sudden and violent blows, it has proved destitute of the requisite tenacity. While very hard, it possesses considerable brittleness.

14. The last mentioned character of the steel affords a ground for doubting its certainly apparent homogeneity, and this conjecture capability of being welded are considerably increased by remelting. If, however, it should prove to be impossible to produce a good caststeel in one melting, the economical advantages of this process would probably be alto-

room is then 6 feet square and 8 high which is to receive the ice; pitch this room all round upon the outside to keep moisture from getting in or out, then board up upon the studs which leaves a 4 inch space all round between studs; then stud up again on two sides, and plank up, the other two being formed by the stone wall), 15 inches from the inner studding. This 16 inches of space all round to be filled with dry saw-dust (perhaps wet saw-dust would do as well.) For convenient ingress to this fixture, I purpose to fit in, near the bottom, a box or case about 7 feet long, one foot deep, and 2 wide, to extend from the outside through the ice room ; the ice is to be lowered in from the top and packed in and around this pitched case, which has double doors lined with cloth; in this case is to be a provision chest to move in and out easily upon rollers; this chest is to be in separate apartments, for the reception of fruit, butter, meats, &c. But instead of this horizontal case and chest, I could insert them in a vertical position under the hatchway at less expense, although it would be more inconvenient in getting the chest in and out; then again I should not have so compact a body of ice. What do you think of it? Will it answer? Is the horizontal or the vertical way best? Am I right in leaving the 4 inches air space? Should the saw-dust be wet or dry? Will moving the provision chest in and out once or twice a day melt away the ice too fast? C. J. F. North Lincoln, Me., 1853.

387

[This plan of an ice house we consider is an excellent one; the saw-dust should be dry. The air space is a good idea, and we would prefer the horizontal drawer. There should be some allowance below for drainage.

The Birmingham of America.

Waterbury, Conn., is the Birmingham of America, as it regards the kind and extent of its manufacture. It is situated in the beautiful valley of the Naugatuck, embosomed among the hills, built on an extensive scale, affording room for gardens, shrubbery, trees, &c., in connection with the dwellings, and a public square in the centre. This town was settled in 1677. For thirty years previous to the introduction of manufactures, the population rather diminished. The first waterwheel was put in motion about the beginning of the present century. For a number of years the manufacture of clocks was the principal business of the place. In 1802 the manufacture of gilt buttons was commenced, a business which has tended to develope the resources of the town. In 1810 the manufacture of woolen goods was introduced, and in 1837 that of the lasting or covered button. There are now over thirty companies, embracing more than two millions and a half of capital, engaged in the manufacture of brass, copper, plated metal, German silver, suspenders, and webbing, hosiery, cutlery, felt cloth, pins, hooks and eyes, buttons, umbrella trimmings, files, dressed leather, buckles, shawl pins, jewelry, &c., and in the mercantile business, connected with them. The town contains seven thousand inhabitants. It has its water-works. furnishing the sparkling pure water from a spring on the hill, so high as to run in the upper stories of the hotels. It has also its gas works and other appendages of our sea-board cities.

By the news from various places we perceive that the heat has been nearly as oppres, sive as in New York City, but not so fatal because there is such an eternal driving in is confirmed by the fact, that its tenacity and sunshine and storm here, to advance in the world of evil spirits.

Ice Houses.

MESSRS. EDITORS-I want to construct imfamily use. My cellar is 44 by 40 feet, and 8 feet high; the wall is split granite, with a my plan :--- I would first line off upon the cel-

To a weak mind a name is of more consequence than the thing itself. This has been manifested by one of our cotemporaries, by an exhibition of spleen against the People's College, because it was not named an "Industrial School."

A correspondent is a cotemporary in writing about navigating the air, says, "if it is within nature's law, it is practicable at the present moment, if not it is impossible."-Bright idea this; ask the birds if it is within nature's law; and John Wise if it is possible.

Two young men in Danvers, Mass., recently pegged 160 pairs of women's shoes in ten

INVENTIONS. NEW

388

Regulating the Speed of Steam Engines. Luther R. Faught, of Macon, Georgia, has invented a very ingenious and original improvement for regulating the speed of steam engines, by cutting off the steam in the steam box when it exceeds the established velocity. The speed of the engine is regulated by the "cut-off," which consists of a plate of metal placed to fit and work on the back of the slide valve, which is furnished with certain open ings through which the steam must pass into the cylinder while the cut-off plate is in a proper position. The form of this cut-off is not new, but the method of operating it is peculiar: the cut-off is caused to move with the slide valve by means of friction produced between them by suitable means, and by attaching the rod of the former to a pendulum axis or other device capable of offering resistance to its movement, which causes it, when the velocity increases to move a shorter distance than the slide valve and thus close the steam openings of the valve, and cut off the steam before the termination of the stroke of the piston. The steam passages of the slide valve are closed earlier or later, according to the velocity of the piston, by the action of this governor valve, to regulate the speed of the engine. The governor valve is therefore operated by resistance which increases as the undue velocity of the engine increases, to cut off the steam early when necessary. Measures have been taken to secure a patent.

Improved Metallic Hub.

An improvement has been made in metalic hubs for wheels of vehicles, by J. B. Hayden, of Easton, N. Y. The improvement effectually prevents the spokes from working in the mortices of the hub, by any lateral movement -an important consideration. In the hub these spoke mortices are cast in two separate parts, forming two sections; and there is a thin ring plate secured in the hub between them. The lower ends or shoulders of the spokes have thin grooves (one in each) cut into them, into which the thin plate ring fits, and the tennons of the spokes pass into the mortices on each side of the plate, in such a manner as if one spoke fitted into two mortices in the hub, with a binding ring or key between them, rivetted to the spokes, thus effectually preventing them from working loose in the hub. Measures have been taken to see cure a patent,

Cast Iron Driving Wheels.

Henry A. Chase, of Boston, Mass., has invented an improvement in cast-iron driving wheels for locomotives, which consists in casting the "counterbalance" in a double-plated chilled wheel opposite the crank-pin in the inner face of the tread, between the two sides, but not touching them. It is cast on the tread, and stands up from it in the hollow part of the wheel, like a plate, but is not attached to the hub. The plates of the wheel, therefore, are made of equal thickness throughout, and consequently when cast they contract equally. The counterbalance, or solid plate cast opposite the crank pin, inside of the wheel, is therefore free to contract without affecting the side plates after being cast. Measures have been taken to secure a patent.

Improved Lime Kiln.

H. D. Mandeville, of Cedarburg, Wis, has For China. which is being carried through the mill and saw frame wearing the piston untrue and out Mr. Walker cannot proceed on his mission taken measures to secure a patent for an imsawed into planks by the gang of saws in the of line. The shaft for the fly wheels is firmprovement in lime kilns. The fire places and frame; D is a rag wheel and backing pulley, | ly secured at the bottom of the frame, and heating flues are arranged around the shaft of E being the pulley to back the carriage ; G G ns in suitable boxes The fender pos the kiln in such a manner that the fire doors constructed in such a manner as to form guide are fly wheels with pins set eccentric, formare all brought to one side or front of the kiln, ing cranks; they are attached to the connectslides for the saw frame. It is best to make but the heat is distributed into the shaft all the saw gate of wood and boiler iron combined ing rods, H H: I I are steam cylinders firmaround by the flues which are so arranged ly secured to the fender posts in such a posithe iron being so cut as to project up and that they can all be cleared through the firetion that the centre of the piston rod is in line down upon each side piece, making a cross doors. The fire places are constructed with with the centre of the cross section of the frame side to side, all rivetted securely tospaces or chambers in the masonry above. saw cross head. The saw gate is made in gether,-allowing an opening in the bottom whereby they are relieved of the weight of penses. and top girts to hang the saws in, and made the usual way, except the top cross girt, which wall, and are more easily repaired when reis projected over the sides sufficient to let the of a strength according to the number of saws Another Steam Boiler Explosion. auired. piston rod press against it in its upward moto be employed. Each cylinder has a stufftion. The piston rod is secured to the cross ing box on each end, and the piston rod is New Corn Crusher. guided so as to work truly through the cylin-Thomas Durden, of Montgomery, Ala., has girt by adjustable stirrups, and the connectingtaken measures to secure a patent for a new rod pin projects over the cross girt, so as to der. corn crusher, which is exceedingly well adapallow the said rod, which is attached to the The carriage, or feed rollers to forward, the timber to the saws for feed and back motion, ted for cracking and crushing corn in the ear, fly wheel, G, to work clear of the cylinder.also various other vegetables. The hopper may be applied with equal advantage accord-There is also a piston rod extending through pressure was the cause of the accident.

ceives the ears of corn by various small openings; they pass down and are first cut by a revolving S-shaped knife on a vertical spindle, and after that they pass down and are crushed between grooves and projections on the revolving spindle, and grooves and projections on the inner face of the machine. The grinding parts are of cast-iron, the inside of the case being a hollow cone, its bottom where it | rected and intended principally for this purdischarges being the apex, and the grinding pose. Measures have been taken to secure a spindle or muller acting with its outer on the patent.

for the reception of the corn is peculiar; it re- | inner surface of the case. The apparatus is | ing to the kind of lumber to be sawed. For simple and good.

> Improved Heating and Steaming Apparatus. Jesse Neal, of Hudson, Ohio, has invented an improvement in apparatus for heating and steaming purposes. It is intended, principally to be used in a dairy for the heating of milk to make cheese curd. Its adaptations are di-

BROWN'S IMPROVEMENT ON SAW MILLS.

Scientific American.



The annexed engraving is a view of an im-, the bottom of each cylinder, which is attachprovement in saw mills, invented by Isaac ed to a bracket on the side of the saw frames Brown, of Baltimore, Md., for which a patent to press in the downward motion of the piston on the bracket, and give motion to the was granted on the 19th of last month. The improvement relates to gang saws. saw frame. Owing to this mode of connect-The engraving represents a front view of ing the piston rods with the saw frame, the vibrations of the latter are not communicated the saw gate, with a log passing through the

mill. to the piston to make it wear out of line in A A is the saw gate; B B are the fender the cylinder. The claim of the patent is for posts; C is the carriage with a log, L, on it, this mode of preventing the vibrations of the

flooring boards, or white pine boards, using circular saws for edging, the feed rollers will be the most expeditious mode of manufacturing lumber. For ship plank, and bill timber, the carriage may be considered the best, either with constant feed or rag wheel. Six inch steam cylinders of twenty feet stroke will be sufficient to work a gang of fifteen saws for sawing ship planks. Eight inch cylinders of twenty-four inch stroke, will drive from 30 to 40 saws, cutting flooring inch boards edged by circular saws. The fly wheels are about 4 feet diameter, and weigh 1,000 lbs. each. Their faces are turned to receive a belt to work the shaft of edging saws. One steam cylinder of 6 inch bore, and two feet stroke will drive a saw hung on each side of it; a separate carriage being provided for each, two logs may be fed into the saws at the same time.

These mills are very portable, they can be put up in a short time, and Mr. Brown informs, us they can be furnished at half the cost of other mills, which will do the same amount of work. They require less hands to operate them, and with a steam boiler and the trame and appendages as represented in the above engraving, there is at once a handy and convenient steam saw mill. Orders for these mills are filled by Messrs. Stillman, Allen & Co., ot the Novelty Works, this city, and more information may be obtained by letter addressed to Mr. Brown, No. 90 South Exeter street, Baltimore.

The Ericsson not at the Crystal Palace.

About two weeks ago one of our city papers, stated that a beautiful Ericsson engine was to be on Exhibition, and spoke of it in the most flattering terms, as something which would astonish the public and more than prove all the high flown panegyrics paid to it previously by the same paper. On Thursday last week, the same paper published a communication stating that the application for space in the Crystal Palace for the said engine had been withdrawn. This is true, as we have learned by special inquiry at the office of the Crystal Palace Association. The Superintendent of Machinery, Joseph E. Holmes, Esq., a practical engineer, designed to test the power of the Hot Air Engine by a dynometer, and to weigh the amount of coal to propel it. We could not learn what the reasons were which induced the builders of the Ericsson engine to withdraw the application,we present the fact and can draw an inference -so can every person who reads this.

Steamboat Inspectors.

Since the letter and remarks respecting Steamboat Inspectors were published in No. 47, Charles W. Copeland, the Chief Inspector of this district (not Robert L. Stevens,) presented us with the new act relating to steamboats, printed at Washington. Section 42 of it excepts ferry boats, tug boats. and towing boats, and all steamers under 150 tons burden-these do not come under the provisions of the act. The Inspectors he intorms us have done all they possibly could to carry out the law promptly and efficiently, but have been much troubled because other governmet officers have not done their duty in furnishing them with proper instruments .-We have received a communication on this subject, which we will publish next week.

to China, because there is not a steam frigate in our navy-at home-fit to carry him.-He should take the overland journey. Where is Mr. Porter with his aeroport? Here is a fine opportunity for him to do his country some service. Let him carry Mr. Walker in his balloon at once to the seat of the war among the Celestials, and bring back a cargo of the best see-oo-chop-shong, to pay all ex-On the morning of the 11th, the flue of the steam boiler at a foundry in West Troy, N. Y., collapsed and killed the engineer Henry, and his brother David Paul. A number of others were severely wounded. The engine was stopped when the accident took place. Over

Scientific American

NEW-YORK, AUGUST 20, 1853.

Patent Law Suits-Sewing Machines.

A suit tor libel has been commenced against the "New York Tribune," by Elias Howe Jr., the patentee of the first machine for using a needle and shuttle in sewing. The suit is instituted because the "Tribune" published the advertisement of I. M. Singer & Co, owners of the Singer Sewing Machine. That advertisement stated that "E. Howe had published falsehoods in saying that he (Howe) had obtained an injunction against Singers' Sewing Machine." It also stated that "it was equally untrue that Howe had the original sewing machine," and it invited all to come and examine the original one, made twelve years before Howe's was heard of; asserting at the same time, that it was the invention of Walter Hunt, of this city. E. Howe, Jr., obtained the first patent in America, for a machine which used two threads and made the lock stitch. In a trial which took place at Boston, Howe vs. Le Row & Blodgett, for an infringement of the plaintiff's patent (see page 356, Vol. 7, Scientific American) the claims of Walter Hunt to the invention of the shuttle and needle sewing machine were introduced, but were considered of no The claims set up for Hunt's machine are a forlorn hope, and when Mr. Le Row, before lied on such claims, we told him that his case rested on a sandy foundation; the result in

for libel under such circumstances, nor a lawyer to be found mean enough to undernor injure his business, but lawyers can be found to advise almost any measures, to make the "penny fee." The Hon. Wm. H. Seward, U. S. Senator, is Mr. Howe's Counsellor in patent matters, but with this case of

exonerated the company from all blame and This case affords another illustration of the censure in regard to the said collision. Five single word when a new case is presented bedefectiveness of our United States Chancery of the Jurors refused to sign the verdict, before us; indeed, were it not a matter of duty Courts with their miserable old and complicacause they thought the company were censuwith us, we would not do it; but, as it is a ted slow machinery. The means tor trying and deciding disputed patent cases should be rable, and they were right. The evidence matter of conscience, we will do our duty went to prove that the accident was caused "whether men will hear or forbear." The ample and rapid in bringing them to a conclucase referred to was one of a very aggravaby a difference of 21 minutes time in the sion ; instead of this, there is the same see-saw watches of the engineers and conductors of ting and melancholy character. A poor man, snoringly-draw system in existence now that there was fifty years ago. Some patent the two trains. The conductor has the con-Thomas Reily, when within but a short discases before our United States Courts might trol of running a train, and the engineer is tance of his own door in Ridge street, while well be represented by a snake with its tail in under his orders, and no evidence was prequietly walking home, smoking his pipe, in ter." sented to prove that the engineer Anderson the broad blaze of the noon-tide sun, was sudits mouth endeavoring to swallow itself. The disobeyed orders. The cause of the accident denly struck down upon the pavement by a case must first appear in equity and then eminent lawyers must speak on it for three or four indirectly was the miserable railroad system piece of metal from a boiler which had exploded in another street (Attorney) in Pratt's days, going over the whole history of the inwhich so extensively prevails in our land.vention; then it may be carried before a jury. We have been the stern advocates of double foundry; his skull was fractured, and in two tracks, and have frequently called attention days afterwards he died in the Hospital. His and then up it will go, perhaps at the end of to this question. Had this railroad been a douwife was standing at the door, and saw him fourteen years, to the Supreme Court at Washble track, would such an accident have occurcoming home; she turned her back to enter, ington. When application for an injunction red? No. Bad must that system of railroad is made to a judge, on a patent which has then heard the explosion, looked out, and bemanagement be, which, as in this case, is the never been tried at common law, he should held her neor husband lying insensible on the at once, if it is demanded by the defendant, cause of a collision, by a difference of two pavement. The Coroner's Jury, in investigaorder a trial at the next session. This course and a-half minutes in the watches of the difting the cause of his death, hastily decided ferent conductors. The State of New Jersey would save much to patentees, and soon that some man in Canada was the cause it. bring the matter to a conclusion. It would has become infamous by her railroad system, of it,-who the man was they did not know : at once the most contemptible and mean ir oroner charged them to this effect and the public from being inflicted he C our land, fit only for Fejee Legislators, and so they decided. The direct cause of the exsuch quarrels as those of Howe and Singer, Goodyear and Day-the india rubber case-Dahomy exactors. plosior was an over-pressure of steam in a Many'new inventions have been brought not vet terminated, we believe. Among the miserable boiler, and the man in Canada, as many new inventions which are still wantbefore the public within the past five years, alleged, who built it, had no more to do for the preventing of railroad accidents. No ing to benefit mankind, we recommend invenwith the explosion than the shade of Peter journalist. new invention is required to prevent ninetytors to try their genius and skill in improving Stuyvesaut. The owner of the boiler, J. R. nine out of every hundred railroad accidents. our United States Courts in patent trials. Pratt, testified that he bought the boiler for Double tracks fenced in, no crossings, well \$400. and that its first cost was \$1,600; had Can you Recommend the Scientific American ? laid rails, good bridges, and plenty of steady been made in Canada and had been used seven We hope our readers will not overlook the active guards on the lines, with competent months; it was a locomotive boiler. We engineers and conductors, will do all that we splendid prizes offered for the largest lists of have no strictures to make on buying it for subscribers-for \$1,40, to clubs of twenty and have asserted for the prevention of accidents. such a low price-a man has a right to buy over, a journal can be procured abounding in Manv of our railroad companies are "penny as cheap as he can, but at the same time the valuable information upon every branch of inwise and pound foolish;" by a short sighted boiler was not a good one, as it had to be bradustry. Those who have taken the Scientific economy, "they leap over bundles to gather ced afterwards, and was defective in strength American need no urging, but we should restraws." A single collision by the smashfor the pressure it had to carry. Now the

would call their neighbors' attention to it. \$20,000-a dead loss-and perhaps five times Can you not recommend it as a paper of rare this amount for the payment of damausefulness? Do so if you can. Twelve persons are to secure cash prizes payable on the 1st of January next, that time is not far off. We hope not only to profit ourselves, but also to profit all who will become readers of our paper and competitors for the prizes. We have but two agents, B. S. Hill and J. C. Bartlett, who have any authority to canvass tor subscribers, these gentlemen we know to be reliable and trustworthy. It is our intention to dispense as much as possible with the travelling agency system. We therefore offer prizes of sufficient value to induce our readers to canvass for subscribers in districts where they are known and not distrusted. Subscribers can be sent in at any time until January 1st in competition for the prizes. We do not require that they shall all come from one place, we will mail the paper to any address required. Last year John Marston, an industrious mechanic, of Saratoga Springs, secured a prize of \$60 for his efforts in procuring subscribers to this paper, he assured us that he had very little trouble in obtaining them. It should be understood that our local or travelling agents are not allowed to compete for the prizes.

Railroad Accidents---The Remedy.

On the 10th inst. a terrible collision took the account of the investigation in the daily importance, and the plaintiff gained the case. place on the Camden and Amboy Railroad, papers, and thought you were rather severe in New Jersey, between the train from New language and not correct in opinion. Since York and the one from Philadelphia, by then. Thomas Service, the engineer, has died which four persons were killed and seven his suit commenced, informed us that he retrom injuries he received by the explosion, others wounded. On the New York and and having again read over the proceedings of New Haven Railroad the next morning (11th) the coroner's investigation in the Reily case, that case strewed such claims to the winds. the night train came in contact with a mass my opinions have undergone a change, and I We certainly do not think that Mr. Howe of rock which had rolled down on the track, now believe you were right. With that fais justified in suing the "Tribune" for libel. by which the engineer was killed and the culty of detecting error which justly charactebut neither was it right tor that paper to adfireman severely wounded. The Coroner's rizes the Scientific American, your remarks mit the advertisement of Singer, containing, Jury in the case of the New Jersey collision were not too severe-the decision was an inquest, was composed of no less than twentyas it did, such pointed and offensive language. outrageous" one. R. M. The "Tribune" stated "it did not believe one persons, sixteen of whom, in our opinion Aug. 11th, 1853. A Mechanic. have returned a morally wrong verdict. The there was a man mean enough to sue them [Only that our attention has been painfully inquest was held at Oldbridge, Middlesex directed to this case again, by the death of Co., and the substance of the decision is another viewe, we out not have added a take the case." The "Tribune," we helieve. "that the collision was coused by the cross brief word to the brief remarks referred to by never intended to hurt Mr. Howe's feelings carelessness of John Anderson, the engineer of our correspondent. the New York train running at an unusual speed by the station and around the curve at Murder has stalked and now stalks through our city and land so brazen-faced, in the form Oldbridge. They also found the conductor censurable for omiting to compare his watch of steam boiler explosions, and we have so says :often in vain directed the attention of lawful with that of the engineer, and the standard clock at the New York station." The Jury authorities, and "the people," to such cases, libel he may have nothing to do. that we almost consider it labor lost to sav a

ges to the relatives of the killed and injured. Such accidents as those mentioned we expect, will take place until our railroad system is reformed. The people can do this by legislation, and until they do it, we will hold them culpable.

In connection with the above cases, another melancholy collision took place on the Providence and Worcester Railroad, on the morning of the 12th inst, by which 12 persons were killed, and 25 more or less injured. An excursion train out of time, was met by a regular train, running at a rapid rate, and both trains were dashed together and interlocked. This accident could not have taken place on a double track. Our railroad system is bad, and many of the lines are mismanaged with the most glaring recklessness mixed with gross stupidity. Our people should awake to a true sense of their duty; the remedy for railroad accidents is merely a performance of duty.

Pratt's Steam Boiler Explosion.

MESSRS. EDITORS-On page 368 of the Scientific American (three weeks ago) the decision of the jury in the case of Thomas Reily was published, which decision you characterized as an "outrageous" one-not creditable to coroner or jury. At that time I had read

gard it as a great favor if our subscribers ing of two locomotives, will cost about maker of a boiler is not to be held responsible for making a cheap boiler, if he only warrants it to carry a low pressure. Is the maker of a tea-kettle to be held responsible for not making it strong enough, if it bursts to pieces and scalds five or six persons, because its lid was tied down by the person who was using it ? Surely not. We therefore believe that the maker of Pratt's boiler, this Mr. Nobody, was not the least to blame tor its explosion, but those who were using it. Mr. Pratt bought it cheap, and assumed all the responsibilities of using it, for the safety or danger of those around it.

> At the present moment there are hundreds of these powder magazine boilers in our city, to the great danger of the lives of our citizens. There should be boiler inspectors to examine and watch the condition and workings of steam boilers in every city, so as to check unscrupulous men from carrying dangerous high pressure steam in inefficient boilers. Of one thing we are sure, however, if a hundred boiler explosions were to take place in a single day in our city, and a thousand lives sacrificed, nobody would be to blame, if all the Coroner's juries were composed of the same materials, and were guided by the same principles, as the jury in the case of the death of Thomas Reily, by the explosion of "Pratt's Boiler."

Events of the Week.

FRANCE ON THE SCIENTIFIC AMERICAN.-Speaking of the Scientific American the Paris " Invention " says :-

"The excellent illustrated journal of Messrs. Munn & Co., is a vast panorama, exhibiting the wonders of the civilization and industry of North America. We take pleasure in introducing this publication to any who may desire to examine it or to subscribe for it."

[We feel obliged for this polite introduction to the French people. We do intend truly to exhibit the "wonders" of American industrial progress, and they will be shown conspicuously in the fore ground of our panorama. But it is also our ambition faithfully to represent all the most notable events of European industry; indeed, we desire to make our paper merit the title of the panorama of the world's industry.

OCEAN TELEGRAPH.—One of our city dailies in speaking of the proposed ocean telegraph

"The telegraph, now, is not always reliable, but if it comes to telling real fish stories, will not its usefulness be diminished or destroyed ? Besides, some fish-like eels, for instanceare said to be charged with electricity. Who knows but they will monopolize the use of the wire? Perhaps some of our so-called scientific journals which claim to possess all the knowledge extant on every subject, will intorm us. At all events, they can tell us whether the telegraphic news will be fresh after having passed through so much salt wa-

A so-called scientific journal can answer the last question, and can assure the editor that the news will be perfectly tresh when it arrives, as it will not pass through the salt water. The first question being a fishy one, can be answered best by the paper that asked it; its pretence to all knowledge on every subject is boundless. We cannot conceive, however, how it ever entered into the head of the interrogator to ask such a question, for eels charged with electricity are surely beyond the power of monopolizing any more of

A FAVORED EDITOR.-A number of the merchants of Glasgow, Scotland, recently presented the editor (Robert Gunn) of the North British Daily Mail," with a purse containing £390 (\$1,950) in testimony of their appreciation of his ability and enterprize as a The San Jacinto. By the "Washington Star" we learn that this war frigate is to get in new machinery when she arrives. Well this is too bad; our naval steamers, with a very few exceptions, are a disgrace to our country.

389

The cotton crop in Alabama and Mississippi, as we learn by our southern cotemporaries, will be an early and large one.

390

Scientific American.



Reported Officially for the Scientific American LIST OF PATENT CLAIMS Issued from the United States Patent Office

FOR THE WEEK ENDING AUG. 9, 1853

WINNOWERS OF GRAIN-By Samuel Canby, of El-licott's Mills, Md.: I claim the construction of the receiving and discharging passages for the grain that is, the passare at the door, passage, I and pasthat is sage, J, in the manner set forth.

MULTIPLYING GEARING-By Frank Dibben & Lew-is Bollman, of New York City: We claim the em-ployment in any manner as described, for the pur-pose of transmitting rotary motion at a multiplied or decreased speed of two pairs of toothed or fric-tion wheels, combined as described, to wit, the said wheels being placed upon two area one of which is wheels being placed upon two axes, one of which is capable of revolving round the other, one wheel of each pair being on one axis, and the other wheel of each pair being placed upon another axis, as set forth forth

[This is a very ingenious invention, and we hope soon to present an engraving of it. See notice on page 236, Vol. 7, Sci. Am.]

LIFE BOATS-By Daniel Dodge, of New York City, and Phineas Burgess, of East Boston, Mass : We do not claim a boat having an opening extending com-pletely through it, whereby it is rendered, by the addition of a floor, fit for service in opposite posi-

addition of a floor, fit for service in opposite post-tions on the water. But we claim the central fixed platform, which is secured in the opening of the boat in a plane pass-secured in the opening of the boat in a plane passing centrally and horizontally, or nearly so, through the same, or which may be said to form a partition between two opposite recesses, as described, the said platform serving as a floor to the boat, whichever side is upwards, and being, from its fixed position, incapable of becoming disarranged by any accident

[See engraving of this useful improvement in No. 16, this volume.]

SETTING UP TEN PINS AND RETURNING BALLS-By G. W. Eitchell, of New York City: I claim set-ting up the pins of an alley by an apparatus opera-ted from the head of the table or elsewhere, by means of a weight or weights sattached to them by codds when combined with the elevation board which raises and sustains the weight or weights to admit of the pins being knocked down, as described. I also claim the use at the back end of the table of a delivery board applied and constructed as de-scribed, in combination with an elevator for the ele-vation and return of the balls, as described. SETTING UP TEN PINS AND RETURNING BALLS-

CARPENTER'S CLAMPS-By B. H. Green, of Prince on, N. J.: I claim the combination of the adjusta ble vibratory arms and reversible jaws, with the adjustable clamp, for the purpose of presenting jaws of different sizes and at different distances from each other, as set forth.

MODE OF DRYING PAPER-By John Hartin, of New York City: I claim drying paper by passing it between opposite series of equal sized fans, which revolve with equal velocities; by which a pressure of air of equal force is made to act simultaneously upon opposite sides of the paper, and thereby insure smooth and uniform surfaces upon the same, as set forth. forth

RAILROAD CAR SEATS-By Samuel Hickok, of RALLEGAD CAR SEATS-By Samuel HICKOK, or Buffalo, N. Y.: I claim constructing a railroad car seat by connecting and arranging the sliding seat with the revertible back hinged at the extremity of the reversing arms, and combining therewith the double ratchet bars, in such a manner that it can be easily converted in either direction into a day or night seat, and at the same time not occupy more space than the ordinary stationary seat, as set forth. Laiso claim tha triangular foot rest in combina I also claim the triangular foot rest in combina tion with the sliding seat, whereby it is made adap-table to the seat when used either as a day or night seat, as set forth.

WINNOWERS-By L. S. Ingraham, of Cuyahoga Falls, Ohio: I claim the stair or fluted screen, con-structed as set forth.

IRON POSTS FOR FENCES-By J. W. Jepkins, of Greenport, N. Y. I claim the arrow-headed or bar-bed bottom of the post, in combination with the twisted cross-piece, as set forth.

FIRE ARMS-By George Leonard; of Shrewsbury, Mass. I claim a revolving fire guide, which, by the continued operation of the fire arm, shall succes-sively communicate fire to the different charges of several barrels.

PRINTING PRESSES—By John Lewis, of Buffalo, N. Y.: I claim the swinging bail and the pressure bail, constructed as set forth.

CORN SMELLERS-By E. L. Millis, of Rochester Depot, Ohio: I claim reducing the larger ears of corn to be shelled to a nearly uniform size with the smaller ones, by passing the whole through between a toothed cylinder and concave, where the large ears are caught and partially reduced or operated upon preparatory to their passing with the smaller ones through between a second cylinder and con-cave, when the entire operation of shelling and se-parating takes place, as described. parating takes place, as described.

PRINTING PRESSES-By Joel G. Northrop, of Sy

1.2

REFEATING FIRE ARMS-By Joshna Stevens, of Chicopee, Mass. (assignor to the "Massachusetts Arms Co.) : I claim constructing and combining to-gether, as described, the lock, trigger, and mecha-nism for rotating and locking and unlocking the coambered cylindered, as that while, by a simple pull of the trigger, the operations of enlocking and rotating the magazine or chambered cylinder, re-locking it, and discharging the cock, shall be caused to take place by power applied to the trigger alone, the elevation of the cock, or the cooking of it, shall be previously effected by the hand of a person or means entirely separate from the trigger, as descri-bed.

bed. I also claim the combination of the stirrup, the spring belt, and the lever, as specified. I also claim the combination of the sectoral plate, made as described, with the spring bolt and slot, the said plate being applied and operated essentially as arbained

explained. I also claim the method set forth, of constructing the lever, viz, of two parts (turning on one common pin) in combination with their confining and adjusting screws, as described. DESIGN.

STATUE OF DANIEL WEBSTER-By Thomas Ball, (assignor to G. W. Nickols), af Boston, Mass.

American Association for the Advancement of Science.

As we have stated in a previous number, this respectable Association, after a two years³ recess, met at Cleveland, Ohio, on the 28th of last month, and continued in session for five days, then adjourned after deciding upon the meeting in the city of Washington, D. C., in May next year. We will now present an abstract of the most practical interesting papers, and finish the same with this volume of the Scientific American.

Prof. Pierce, of Cambridge, Mass., President of the Association organized the meeting and delivered a very neat and appropriate address. He said :-

"We are again met in the service of a high cause; after the unusual interval of two years we have again come together at an appointed rendezvous, to make each other glad with the tidings of truth which we bring from the heavens and the earth, and to reanimate our fainting zeal by the story of the successful search for the philosopher's stone, the true elixir vitæ, the fruit of the tree of knowledge, and the footprints of Him to whom the earth is a footstool.

Gentlemen, we are not convened for a light duty. Our self-imposed task is not an amusing child's play, and we have not accepted the liberally offered hospitalities of this beautiful city for the enjoyment of a social festival We have come to give and to receive instruction and inspiration.

Gentlemen, we have come to study our duty as scientific men, and especially as American scientific men. We are to learn the apparent and not very pleasant paradox that America cannot keep pace with Europe in science, except by going ahead of her. The New World must begin to build upon a level above that of the Old World, and it must build from its own materials. This is not asking too much. It is no more than was accomplished by the American Ship and the American Reaping Machine. The Yankee who picked the hardest lock in England, and contrived a lock which all England could not pick, is but a type of American intellect. This was a work of mind, and we have a right to expect equal excellence in higher and more abstract efforts of American genius.

But above all things it is not to be forgotten that the temple of science, by whomsoever built, belongs to no country or clime. It is the World's Temple, and all men are free of communion. Let us not mar its beauty by writing our names upon its walls. The stone which we have inserted is not ours; it is not thine, it is not mine, but it is part of the temple.

Let us not presume to make these walls resound with the bickerings of angry contention

is a fluid. He said he had now the pleasure of confirming the impressions he then held. condemnatory of the theory advanced by La Place. We quote a passage from his remarks at Cincinnati :--

"The author of the 'Mecanique Celeste proved that Saturn's Ring, regarded as solid, would not be sustained about the primary, unless it had decided irregularities in its structure. But the observations of Herschel and others have failed to detect any indications of such irregularity, and a laborious series of observations have finally convinced Mr. Bond of the utter impracticability of any important irregularities, and he has, therefore adopted the conclusion that Saturn's Ring is not solid but fluid. * * * * I am now convinced there is no conceivable form of irregularity. and no combination of irregularities, consistent with an actual ring, which would permit the ring to be permanently maintained by the primary if it were solid. Hence it follows, independently of observation, that Saturn's Ring is not solid."

LITHOGRAPHY .- A paper of which the tollowing is an abstract, was read on this subject by Lieut. E. B. Hunt, U. S. N. This art was discovered by Aloys Senefelder, in 1799, only 54 years ago. By the labors of D'Offenbach, DeLasteyrie, Engelmann, Ackerman, Lemercier, and others, the intant art, in being propagated from Munich, its birth-place, has also been much improved in many of its details, and has had some important extensions of its sphere of usefulness and capacity. De-Lasteyrie's autographic printing and Engelmann's printing in colors, were great expansions of Senefelder's invention, while the excellant management of landscape and scenic effects in Ackerman's establishment in London demonstrated a new capacity of the art. Of all artistic inventions none has so eminent a capacity for being abused as Lithography. In thoroughly skillful hands, it has the capacity for producing effects of a high order, and some which are peculiar felicities of this art alone. But that this result may be attained, it is indispensable that labor, care, and skill, and indeed all the elements of any excellent art, should conspire. The artist needs to be such in fact, as well as in name, and the printer must possess appreciation of the subject printed, and a technical mastery of his business, such as is quite too rare, especially among us.

Lithography owes not only its existence but its possibility to the fact that several quarries, in the vicinity of Munich, furnish slabs of a limestone unform in texture, apparently compact, yet really having a somewhat open grain. Though other localities furnish stones which could be used, the real commerce of lithographic slabs is limited to the Bavarian quarries, especially Poppenheim and Sonnhofel. These furnish stones of ordinary sizes, quite cheaply, so that those new quarries, which are from time to time announced, must encounter a slow market at the start, unless they are able to furnish, in all the requisite perfection, the largest sizes used. The qualities of a good stone are homogeneousness, with freedom from veins, specks, and | tail and to the boat. The boat is about nine flaws, a yellowish white, or a pearly-gray color which is uniform, a hard, fine, uniform

phical survey of the interior of France are rearranged by transfer, into excellent maps of the departments, with special borders and titles, and full letter press statistical notes, printed from movable type, and transferred into the proper spaces. In England and Scotland, plate-transfer printing is prosecuted as a business, though with what success I have not the means of knowing. In this country, the great amount of transfer from stone on to stone, in making up checks, bills, labels, &c., supplies many shops with petty jobs in one species of transfer; but a few only are engaged in transferring large steel or copper plates. To do this well requires a man to make plate-transferring his business, and otherwise, not only will he fail of success. 16 will be apt to seriously injure or detace plates entrusted to his handling. Our principal establishments in which plate-transfer printing is extensively executed are, J. Ackerman's, No. 379 Broadway, N. Y.; D. McLellans. No. 26 Spring street, N. Y.; Wagner & McGuigan's, Franklin-square, Philadelphia; and Duval's, Philadelphia. The plates of the Coast Survey Report have been in part printed by each of these establishments, though sometimes their work has furnished very poor evidence of any skill in managing this process. It was by being tor the last two seasons assigned to the charge of inspecting the work on these plates, executed by the two firstnamed establishments, that I was led to such an acquaintance with the subject as to induce

me to make this communication. (To be Continued.)

Remarkable Discovery in Russia.

M. B. Larsky, the engineer, lately deceased, who had also acquired a reputation as a poet and an archæologist, made a discovery of the greatest importance in White Russia-a discovery brought to light when his papers were examined after his decease. Being occupied in making a road in that province he found it necessary to drain off the waters of a lake into another lake at a lower level, and in the course of the operation he discovered in a forest, several feet below the surface of the soil. a road paved in the antique Roman or Mexican style, with traces of a stone bridge ot a peculiar construction. In M. Larsky's opinion 2000 or 3000 years must have elapsed before the face of the country could have been transformed to such an extent as he observed, and if this supposition be well founded this district must have been inhabited before the time of the Scythians by a more civilized nation. M. Larsky's discovery will, doubtless, not pass unnoticed, and may lead to important results.

New Sculling Propoller.

A small boat has recently been constructed at Richmond, Va., which is propelled by a propeller, called the "submerged or scull propeller." The power is applied to the stern of the boat, and operates in the manner of a fish tail waving from side to side, to give the impetus. On each side of the boat there is an upright lever, between which the operator sits, and by working the levers backwards and forwards, the motion is given to the fishfeet long and three wide, and the speed, with

10	racuse, N. Y.: I claim the combination of the se-	for superior distinction, and the four com-	for which is annorm, a hard, hile, annorm	one man in it, about four miles an nour.
	ries of intermittingly rotating platens with a vibra-	plaints of mortified vanity. Let us not raise	grain, a conchoidal fracture with a good de-	
	ting bed, when so arranged as that the delivery of the printed sheet is from the lower of the series	the money-changers' cry of ' mine and thine.'	gree of strength, and a capacity for receiving	Potato Rot.
	of platens, so that it may drop from the platen on to	lest the nurifier come and taking the royal	good grained or polished surfaces, and of be-	Accounts from various places inform us that
	the paper table, or into a drawer, as described.	iowal into his own possession thrust up out	ing uniformly acted on by acids.	the potato rot is very prevalent this year
	FRICTION ROLLERS By James Patterson, of	jewer mito mis own possession, under us out	Automorphic printing is not now much used	We are glad that the wheat crop will make
	Franklinville, N. Y. 1 claim fitting the bearing of a rolling car wheel on a fixed axle with a series of	into the ditch, and turn our rame into infamy.	Autographic printing is not now much used,	un the deficiency During the past two years
	friction rollers having bearing of large diameter to	It has been observed by others not of our	though cases frequently occur in which it is	notatees have been too dear for near nearly
	run in contact with the wheels, and of smaller dia-	own number, that the meetings of the Asso-	very convenient or even important. Special	polatoes have been too dear for poor people
	ing enlarged at the point of contact with the rollers.	ciation have been characterized by a generous	attention, in transfer printing, is to be devoted	to purchase.
	as specified.	appreciation of each other's labors. But mu-	to the quality of the paper used. The paper	The city of New Orleans is severely afflict-
	ROLLING RAILROAD AND OTHER IRON-By A. B.	tual admiration is not our only or our most	has a great effect both on the clearness of the	ed with yellow fever this summer; no less
m I I	myself to the modes of application specified; nor do	necessary office. Mutual criticism is equally	printing and the duration of the transfer	than 200 have died in one day. The cholera
	I claim the employment of a series of draw rollers	imperative and equally conducive to the best	Transfer printing, even as it is now practiced,	was not half so deadly.
	to draw it into a required form.	interests of the Association.	must be called eminently useful. Senefelder	
	But the employment of a series of pairs of rollers,	We must not permit erroneous state-	himself used it, though quite imperfectly, of	Great fires have recently been raging in the
	to move from or towards each other to adapt them-	ments to pass unchallenged. It is our stern	course; but it is only during the past twenty	woods of New Brunswick, and Prince Ed-
N	selves to the condition of the metal in the process of rolling, as specified.	and solemn duty to criticise and expose all	years that its capacities have been really de-	wards' Island, provinces.
R		•	-	

TO CORRESPONDENTS

W. B., of Pa.-You express yourself somewhat sur prised to see Mr. Mills scheme published in the Scientific American. It may or may not be practica ble-we did not decide upon this point-we presented the subject as one of novelty and interest, our readers are not obliged to believe in it, and there is no reason why we should not publish it as we do many other new and untried schemes. Let us have all sides fairly presented. We will decide upon what shall or shall not appear in this paper, and employ our own terms in dealing with all subjects

V. L. M., of Pa .- On the New York and Philadelphia Railroad, the curtain which you describe is employed on the cars to prevent the rising of the dust from the track. It was suggested by an eminent mechanic living in this city-it works admirably, and we hope to see other roads adopting it.

H. J., of Ind.-We expect soon to publish engra vings of Irving's Boiler, then you can readily understand the principal upon which it operates.

H. T. R., of N. H .-- Explain what you mean by anchors for stopping railroad trains. The mere idea is not patentable. You must fix your ideas into a tangible contrivance.

A. C. C., of Tenn .- It is impossible for you to make the rails answer the purpose of a covered wire. You cannot properly isolate them. You may be sure of this.

W. T., of Me .- We see nothing new or patentable in the plough, but the fence appears to possess novel features

R. of Nova Scotia .- Richard Kitson, of Lowell Mass, can give such information as you desire in regard to oakum.

W. J. T., of N. Y .- We received your letter June 6th, and replied to it very promptly, the reply missed you it appears. We advise you to send us a model of your measurer

T. B., of Ind.-There is nothing patentable in your method of coupling, we have seen the same thing before used in carriages.

J. A. T., of Miss.-G. Page, of Baltimore, Md., or Geo. Vail, & Co., Morristown, N. J., canfurnish you with portable saw mills. The clock work for faning rooms was invented and patentee by Com. Barron, 1830.

A. G., of Ill.-Yours came too late for this num ber. It was a most unjust act in your case. E. J. H., of Pa-Mr. R. is now at Niagara Falls,

superintending the erection of a new suspension bridge; we have not seen his article but will look for it

M. B., of N. H.-You have never read the history of the steam engine; read it.

L L, of Ohio.-The papers of the scientific association will be published by the city authorities of Cleveland.

H. McN., of Conn.-There is no difference between your principle for heating apartments and heating them by steam pipes connected with a boiler.

substance; a caveat was filed some twelver new in since for essentially the same thing.

T. F. W., of England-We do not know of "selfacting gates at railroad crossings," like the one decribed in your letter ; there are, however, good gates here for the same purpose, but railway companies do not feel willing to trust them.

Money received on account of Patent Office busi-

ness for the week ending Saturday, Aug. 13:-Hess for the week ending Sautray, Aug. 15.— H. L. R., of Mich., \$60; J. L. L. M., of Pa., \$30; C. W. C., of Mo., \$30; G. B., of N. Y., \$100; E. M., of Pa., \$55; J. C., of N. Y., \$30; H S, of Texas, \$50; W. E. B., of Ala, \$30; J. M., of Ghio, \$50, W. McB., of Ohio, \$30; J. P. H., of Ohio, \$30.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday Aug. 13:-

S. P., of N. Y (2 cases) ; H. A. C., of Mass. ; W. M. & K., of 111 ; W. F. M., of N. Y. ; A. E. B., of N.Y.

A Chapter of Suggestions, &c.

BACK NUMBERS AND VOLUMES-In reply to many interrogatories as to what back numbers and vo lumes of the Scientific American can be furnished, we make the following statement -- Of Volumes 1, 2 3 and 4-none. Of Vol. 5, all but six numbers price, in sheets, \$1; bound, \$175. Of Volume 6, all; price in sheets, \$2; bound, \$2,75. Of Vol. 7 all; price in sheets, \$2; bound, \$2,75. Of Vol. 8, all the back numbers subsequent to No. 27, but none previous.

desiring the claims of

Foreign and American Patent

IMPORTANT TO INVENTORS.---The under-signed having for several years been extensively engaged in procuring Letters Patent for new mecha-nical and chemical inventions, offer their services to inventors upon the most reasonable terms. All business entrusted to their charge is strictly confi-dential. Private consultations are held with inven-tors at their office from 9 A. M. until 4 P. M. In-ventors, however, need not incur the expense of at-tending in person, as the preliminaries can all be ar-ranged by letter. Models can be sent with safety by express or any other convenient medium. They should not be over 1 foot square in size, if possible. Having Agents located in the chief cities of Eu-rope, our facilities for obtaining Foreign Patents are unequalled. This branch of our businessreceives the especial attention of one of the members of the firm, who is prepared to advise with inventors and manu-facturers at all times, relating to Foreign Patents. MUNN & CO., Scientific American Office, 128 Fulton street, New York. IMPORTANT TO INVENTORS .--- The under

TRE'S DICTIONARY-NEW EDITION-A dic-URE'S DICTIONARY-NEW EDITION-A dic-tionary of arts, manufactures, and mines-Con-taining a Clear Exposition of their Principles and Practice, by Andrew Ure, M. D., Illustrated with sixteen hundred engravings on wood. Fourth Edi-tion. Corrected and greatly enlarged. Many of the articles entirely re-written, and many new cuts ad-ded. 2 large vols, 8 vo. cloth. D. APPLETON & CO., will shortly issue a new edition of Ure's Dic-tionary, re-printed entire page for page with the new and greatly enlarged edition just published in England. Although this work is enlarged to two volumes, comprising in all 2116 pages, the price of the new edition will not be increased beyond the price of the former edition-Five Dollars. The trade and the public are invited to send their orders without delay to ensure prompt delivery of this very cheap and popular work. 200 Broadway, N. Y 49.2

WANTED-The address of a mochinist who un-derstands making machinery for manufactu-ringg an improved gun lock. I shall want a ma-chine for pressing the hammer, for pressing the dog, for forming the end of the main-spring, for punching the slot in the plate, for making and head-ing the different sized screws required; a drilling machine, and all the necessary machinery for grind-ing and polishing the different parts of the lock; en-graving the plate, and, in fact, every thing necessa-ry for the rapid and economical production of said locks, except the motive power. Address WM. HENRY, Jr., Wooster, Ohio. 49 3*

A TKINS' SELF-RAKING REAPER-The un-equalled success of this machine, both in grain and grass, and the information already received from agents, shows the demand another season will be more than I can supply. Every reaper heard from (about 30 in seven different States and Canada) gives good satisfaction with no drawbacks, though others, yet to hear from mer bound the to realize something good satisfaction with no drawbacks, though others. ret to hear from would like to realize something inventor (Mr. Alkins) would like to realize something from the patentat once, and part of the States may be offered for sale If a satisfactory price cannot be got, then arrangements may possibly be made with manufacturers to build and pay a patent fee. A machine can be seen at the Crystal Palace, and others will be at some of the State and County Fairs this Autumn. " Prairie Farmer" Warehouse, Chicago, III, Aug. 49 5* 11, Aug. 495* 6th, 1853.

IBON FOUNDRY FOR SALE.—In full operation, twelve moulders employed, and a good run of cus-tom and job work, in a village near New York; alwoys accessible. Address "J. F." box 1209, New Mark Bort Office 49.2* 49 2* York Post Office.

York Post Office. UNITED STATES PATENT OFFICE, Washington, July 28, 1853. ON THE PETITION OF JOHN H TIMS, of Newark, N. J., praying for the extension of a patent granted to him on the 31st day of October, 1839; for an improvement in bearings and oil boxes forrailroad cars, &c., for seven years from the expi-ration of said patent, which takes place on the 31st day of October, 1853. It is ordered that the said petition beheard at the Patent Office on Monday, the 3rd of October next, at 12 o'clock, M.; and all persons are notified to ap-pear and show cause, if any they have, why said pe-tition ought not to be granted. Persons opposing the extension are required to file in the Patent Office their objections, specially set forth in writing, at least twenty days before the day of hearing; all testimony filed by either party to be used at the said hearing, must be taken and trans mitted in accordance with the rules of the office, which will be furnished on application. Office, also, that this notice be published in the Post, New York; Boston Post, Boston, Masz, and Inquirer, Cincinnati, Ohio, once a week for three suc-next, the day of hearing. CHHARLES MASON, Commissioner of Patents.

of State given, and often with the name of the post office also omitted. Persons should be careful to write their names plainly when they address pub-lishers, and to name the post office at which they wish to receive their paper, and the State in which the post office is located. ADVERTISEMENTS. Foreign and American Patent Agency MPORTANT TO INVENTORS.---The under-signed having for several years been extensively margaed in procuring Letters Patent for new mecha-

LAWRENCE SCIENTIFIC SCHOOL, Harvard **LAWRENCE SCIENTIFIC SCHOOL,** Harvard University, Cambridge, Mass. The next term of this institution will open on the first day of Sept., 1853, and continue 20 weeks. Instruction by recita-tions, lectures and practical exercises, according to the nature of the study, will be given in Astronomy, by Messrs. Bond; Botany, by Prof. Gray; Chemis-try, Analytical and Practical, by Prof. Horsford; Comparative Anatomy and Physiology, by Prof. Wy-man, Engineering, by Prof. Eustis; Mathematics, by Prof. Pierce; Mineralogy, by Prof. Cooke; Phy-sics, by Prof. Lovering; Zoology and Geology, by Prof. Agassiz. For further information concerning he School, application may be made to Prof. E. N. Horsford, Dean of the Faculty. Cambridge, Mass., July 15, 1853. 44 8*

PALMER'S PATENT LEG-Manufactured by Palmer & Co., at No. 5 Burt's Block, Springfield, Mass., for New England and New York State, and 376 Chesnut st, Philadelphia; in every instance of com-petition in the Fairs of the various Institutes of this country, has received the highest awards as "the best" in mechanism, usefulness, and economy. At the "World's Fair," London, 1851, in competition with thirty other varieties of artificial legs (by the best artists in London and Paris,) it received the Prize Medal as the best. 47 10*

E DAY Special attention to the properties of Participation of Participatio **DUROPEAN PATENTS**—MESSRS MUNN & Co. pay special attention to the procuring of Pa-tents in foreign countries, and are prepared to secure patents in all nations where Patent Laws exist. We have our own special agents in the chief European cities, this enables us to communicate directly with Patent Departments, and to save much time and expense to applicants.

FOUNDRY FOR SALE-In the village of Wes-L' terly, R. I.; location unsurpassed. Sales of cast-ings, for the past 6 months over \$14.000. Apply soon (post paid) to C. POTTER, Jr., Agent, Westerly, R.I. 47 4*

COTTON MACHINERY-For sale, very low, viz. 1:30 inch batt card, 1 warper, 2 dresser fans, and 1 iron boiler. Apply to E. WHITNEY, New Haven, 24 Ct. 45 6

NORRIS WORKS, Norristown, Pa. The sub-scribers build and send to any part of the Uni-ted States, Pumping, Hoisting, Stamping, and Porta-ble Engines, and Mining Machinery of every de-scription. THOMAS, CORSON & WEST. 40 ly.

NORCROSS ROTARY PLANING MACHINE, N-Decided by the Circuit Court not to infringe the Wood worth Machine-I now offer my Planing Ma-chines at a low price; they are not surpassed by any machines as to amount or quality of work. Tonesta-tion. Augress me at Lowell, Mass., 39 20* N. G. NORCROSS.

ANDREWS & JESSUP-No. 70. Pinestreet New York, Commission Merchants for the sale of all kinds of Cotton and Woolen Machinery, Machinists' Tools, Belling, &c. Importers and dealers in every variety of manufacturers' articles. 43tf

ENGINEERING—The undersigned is prepared to furnish specifications, estimates, plans in gene-ral or detail of steamships, steamboats, propellers, high and low pressure engines, boilers, and machi-nery of every description. Broker in steam vessels, machinery, boilers, &c. General Agent for Ash-croft's Steam and Vacuum Gauges, Allen & Noyes' Metallic Self-adjusting Conical Packing, Faber's Water Gauge, Sewall's Salinometers, Dudgeon's Hy-draulic Lifting Press, Roebling's Patent Wire Rope for hoisting and steering purposes, etc. etc. CHARLES W. COPELAND, 29 26* Consulting Engineer, 64 Broadway.

PATENT LAWS OF THE UNITED STATES I and information to inventors and patentees; for sale at the Scientific American office. Price 12 1-2 cents

WHEELER, WILSON, & Co.-Watertown, Ct., proprietors and manufacturers of Allen B. Wil-son's Patent Stitching Machine. Patented June 15, 1852, it can be seen at the Company's Office, 205 Broadway, New York. 30 20*

A TMOSPHERIC TELEGRAPH—The English patent (just issued) is now offered for sale at the Company's office, 24 Merchant's Exchange, Boston, Mass. 35tf Agent A, T. Company.

KRUPP'S (London Council Medal 1851) CELE-BRATED CAST STEEL-Of any dimensions, warranted superior to any other for Platers and oth-er Rollers requiring hardening; also for hydraulic er Rollers requiring hardening; also for hydraulic

NEW METHOD FOR MAKING WROUGHT-Iron direct from the Ore—The proprietors of James Renton's Patent, who have purchased Aler. Dickerson's patent for the above purpose, are de-sirous of introducing the invention integeneral use, and invite parties who may wish to negotiate for rights for States and counties, or for lurnaces, to make immediate application, and to examine the furnace which is in successful operation at the Ame-rican Iron Company's Works, Newark, N.J. The invention is exciting considerable interest; gentle-men from all parts of the country, who are engaged in the manufacture of iron, have examined the iur-nace in its workings, and give it their decided com-mendation. A circular, giving more minute infor-mation, will be sent to those desiring it. The rights for several States and counties have already been disposed of. Applications for rights in the State of New Jersey may address the Hon. J.M. Quinby, Pre-sident of the American Iron Company. Inquiries or applications for other States may be made to A. HI. BROWN, Newark, N. J. Office 107 Market st. 34tf NEW METHOD FOR MAKING WROUGHT.

BEARDSLEE'S PATENT PLANING Tongu **BARBOLLER'S PATENT** PLARING Tongue-ing and Grooving Machines-These celebrated machines have now been generally introduced in various portions of the United States. More than thirty are now in successful practical operation in the State of New York alone. As an illustration of the extent of work which they are capable of per-forming, with unrivalled perfection, it is sufficient to state that, within the last six months and a half, over five millions of feet of spruce flooring have been planed, tongued and grooved by one of these machines at Plattsburgh, N. Y., never running to exceed ten hours a day. The claim that the Beards-lee machine was an infringement upon the Woodwachines at Plattsburgh, N. Y., never running co-exceed ten hours a day. The claim that the Beards-lee machine was an infringement upon the Wood-worth patent, has been finally abandoned; at dafter the proofs had been taken, the suit instituted by the owners of that patent was discontinued, and the whole controversy terminated on the first of Novem-ber last. Applications for machines or rights may be made to the subscriber, GEO. W. BEARDSLEE, 57 State street, or No. 764 Broadway, Albany. 15tf

391

THE NEW HAVEN MANUFACTURING THE NEW HAVEN MANUFACTURING Company, New Haven, Conn., having purchased the entire right of E. Harricon's Flour and Grain Mill, for the United States and Territories, for the term of five years, are now prepared to furnish said mills at short notice. These mills are unequalled by any other mill in uss, and will grind from 20 to 30 bushels per hour of fine meal, and will run 24 hours per day, without heating, as the mills are self-cool-ing. They weigh from 1400 to 1500 lbs., of the best French burr stone, 30 inches in diameter : snugly packed in a cast-iron frame, price of mill \$200, pack-ing \$5. Terms cash. Further particulars can be had by addressing as above, post-paid, or to S. C. Hills agent N. H. M. Co., 12 Platt st, N. Y. 28tf

MACHINERY.--S. C. HILLS, No. 12 Platt-st. N Y. dealer in Steam Engines, Boilers, Iron Pla-ners, Lathes, Universal Chucks, Drills; Kase's, Von Schmidt's and other Pumps; Johnson's Shingle Ma-ohines; Woodworth's, Daniel's and Law's Planing machines; Dick's Presses, Punches and Shears; Mor-ticing and Tennoning machines; Belting; machinery oil, Beal's patent Cob and Corn mills; Burr mill and Grindstones; Lead and Iron Pipe &c. Letters to be noticed must be post-paid. 40tf 40tf noticed must be post-paid.

B. ELV. Counsellor at Law, 52 Washington A. A. st., Boston, will give particular attention to Patent Cases. Refers to Munn & Co., Scientific American

LEONARD'S MACHINERY DEPOT, 108 Pearlest, and 60 Beaver, N. Y. Leather Banding chanics' and manuracturers' articles, and a superior of oak-tanned Leather Belting. P. A. LEONARD. uality 40tf

PAINTS, &c. &c. American Atomic Drier Graining Colors, Anti-friction Paste, Gold Size, Zine Drier, and Stove Polish. QUARTERMAN & SON, 114 John st., 27tf Painters and Chemists.

LOGAN VAIL & CO., No. 9 Gold st, New York — Agency for Geo. Vail & Co., Speedwell Iron Works, Norristown, N. J., furnish and keep on hard Grist Mill Irons, Hotchkiss's Water Wheels, Iron Water Wheels of any size, Portable Saw Mills, com-plete; Bogardus's celebrated Planetary Horse Pow-ers; heaving forgings and castings for steamboats and rolling mills, Ratchet Drills of superior quali-ty for machinists, Saw Gummers, Hand drills, Tyre Benders, and shafting and machinery generally. 38 1v

E. A. BOURRY & H. E. ROEDER--Consult-ing and Mechanical Engineers; Office No. 333 Broadway, New York City. 439*

C. B. HUTCHINSON'S PATENT STAVE Out-ing Machines, the best in use, and applicable alike to thick or thin staves; also his Head Cutting and Turning, and Stave Jointing Machines. For machines or territorial rights, apply to C B. HUTCHINSON & CO., Syracuse, N. Y. 26tf

D. WHITE'S PATENT CARAXLE LATHES **D.** WHITE'S PATENT CARAXLE LATHES and turning tapers, cutting screws, &c. We manufac-ture and keep constantly on hand the above lathes; also double slide Chuck and common Hand Lathes, Iron Planers, S. Ingersol's Patent Universal Ratchet Drill, &c. Weight of Arle Lathe, 5,500 lbs; price \$600; Engine Serew Lathe, 1400 to 7,000 lbs; price \$225 to \$675, 27tf Windsor Locks, Conn.

PATENT ULAIMS-PERSONS desiring the ordered of	CHARLES MASON,	and other nistons, railway axles, and shafts for	
any invention which has been patented within	Commissioner of Patents.	steam engines, &c. &c. This cast steel admits o_	CIRCULAR SAW MILLS-The undersigned are
fourteen years, can obtain a copy by addressing	P. SEditors of the above papers will please copy	welding without borax with the same facility as	U manufacturing, and keep constantly on hand,
a letter to this office-stating the name of the pa	and send their bills to the Patent Office, with a pa-	iron. THOS. PROSSER & SON, 28 Platt street, New	" Child'z Premium Double and Single Circular Saw-
tentee, and enclosing one dollar as fee for copying.	per containing this notice.	York.	ing Machines." The best machines in use for saw-
PATENTEES-Remember we are always willing to ex-		TALLETER & BROTHER-Onticians and	nable of cutting more lumber in a given time than
ecute and publish engravings of your inventions,	A MERICAN PIG IRON-Of the brands Wm.	dealers in mathematical instruments, 48 Ches-	any other mill. Shafting, gearing, and all other
provided they are on interesting subjects, and have	A Penn, Swede, Amenia, Durham, Allentown,	nut st. Philadelphia Pa. Mathematical instruments	mill work, made to order, with dispatch and in a
provided they are on any other publication. No en-	Sterling, Urane, and Mount Hope—also Sociely 1-8	separate and in cases, Protractors, Spacing Dividers,	Workmanlike manuer. H. Willing & Co. Florence, Hampshire Co., Mass. 44 6*
in any other put of the second part of the second p	sale by G. O. ROBERTSON, 135 Water street, cor.	Drawing Pens, Ivory Scales, Tape Bleasures, Salo-	Florence, Humphine Col, Lass
gravings are inserted in our condities country, and	of Pine. 43 8*	the An illustrated and priced catalogue will be sent	THE NEW HAVEN MANUFACTURING CO.
peared in any other journal in this country, and		by mail free of charge. 39 6m*	No. 2 Howard st. New Haven, Ct., are now fin-
we must be permitted to have the englaving out	TUBNACE AND MACHINE SHOP FOR SALE		ishing 6 large Lathes, for turning driving wheels,
cuted to suit our own columns in size and style	-A first class Furnace and Machine Shop, with	A GOOD CHANCE FOR MANUFACTURING	and all kinds of large work; these lathes weight
Barely the expense of the engraving is charged by	or without stock on hand; has done a business of	A_A Water Privilege of ten feet fall, on a never-	tons, and swing 7 1-3 feet, shears about 10 feet oug
us, and the wood-cuts may be claimed by the in-	about \$15,000 per year for the last two years, which	failing stream, with four acres of choice land, in the	ing as above, post-paid, or to S. C. Hills, agent N.H.
ventor, and subsequently used to advantage in oth-	ness towns in Central New York, on a railroad and	town of Cornwall, Orange Co., N. Y., 5 miles from	M. Co., 12 Platt st, N. Y. 28tf.
er journals.	canal. The owner having been in the business more	the North River, and three miles from the land and	
G Townson Department We often receive	than twenty years, wishes to withdraw from it.	Hoboken RR. For particulars inquire of John J.	TER & LEAVIT Manufacturers of every
GIVE INTELLIGIBLE DIRECTIONS - We often receive	Terms liberal. For further particulars apply to	Vanduzer, 184 Canal st, N. Y., or John Orr, on the	between Walnut and Vine. Cincinnati, O. 27 6m*
letters with money enclosed, requesting the paper	Stuart & Co., 21 Park Row, New York City. 484	premises. 40 13*	between wanut and vino, enderen ,
sent for the amount of the enclosure, but no name	, buart & con a far and far		

CIENTIFIC MUSEUM.

392

Remedy for Yellow Fever.

We have seen it stated in a number of our exchanges that a remedy for yellow fever has been discovered at Angostura, Venezuela .-The remedy is the plant vervain or verbena which grows abundantly in that region. The expressed juice of the leaves given in small doses three times a day, with an enema of the same every two hours, is stated to be a perfect cure for the yellow fever and black vomit, even in their most threatening stages. All the physicians of Angostura have adopted this treatment of the disease, and they state that hardly any deaths occur under its influence. This information is furnished by Mr. Mathison, the British Vice-Consul at the above place.

The varieties of the verbena growing in the warm and temperate regions of the Western world are numerous. The particular species referred to above, is that known to botanists by the name of "verbena jamaicensis." It is a native of the West India Islands. as well as of the continent. There are two kinds of it, the male and the female: the latter is the one used as above. It has long been known to the creole population of Spanish America for its medicinal virtues. They have used it as a febrifuge and an unfailing specific in cases of dysentery. It is generally given to children as a tea, mixed with sugar and milk, and is by no means a disagreeable beverage. The expressed juice of the plant forms a cooling purge for children in fevers. The vervain is likewise a remedy of particular note in sundry maladies that defy ordinary medicines. Sloane says it is a powerful deobstruent: according to Barham, it is likewise an excellent vermifuge. And, having now been discovered as a cure for yellow fever, the shrub must in future rank as a still more valuable addition to the pharmacopæia.

Materials for Milk Pans.

According to the experiments of M. Hinueber, of Moisburg, Germany, one hundred Hanover quarts of milk yielded, in tinned milkpans, 7.07 Hanover lbs. of butter; Glass, 7.04 Wooden (not painted), 6.96; Earthenware, 6'92; Wooden (painted), 6'67. According to the same experiments, there required for one of milk; produced by stall-feeding with tare and clover, 15.67 quarts; by pasturing, 11.84 showing that the milk obtained from cattle fed upon pastures is richer in butter than milk got from cows which have been fed in the stable with one and the same kind of plants: even a mixture of tare and clover shows an

increase over clover alone.-[Polytec. Jour. [By the above, tinned milk pans are the best for cooling milk and obtaining cream. In some dairies, however, all the milk is churned, and we should suppose that this was the best way to obtain all the butter in the milk. There is no butter in the tin, therefore, we suspect, that one vessel is just as good as ano ther, if clean, in which to churn the milk.

Bed Clothes.

The perfection of dress, for day or night, where warmth is the purpose, is that which confines around the body sufficient of its own warmth, while it allows escape to the exhalations of the skin. Where the body is allowed to bathe protractedly in its own vapors we must expect an unhealthy effect upon the skin. Where there is too little ventilating escape, insensible perspiration is checked, and something analogous to fever supervenes.

it is the ingenious employment of this substance which constitutes the chief peculiarity of the invention.



This is an aerated water apparatus, introduced by Messrs. Gaillard & Dubois, of Paris. The main features of this arrangement consist in the employment of three distinct chambers, or receptacles, one being for the water to be aerated, a second to contain the effervescing powders, and a third to retain a small quantity of pure water, which, after the apparatus is closed, is allowed to fall upon the powders, thereby causing the evolution of the carbonic acid gas. This figure represents one modification of this ingenious apparatus. The water, or other liquid to be aerated, is contained in a glass bottle, A, of elegant shape, and formed with a wide cylindrical neck, to which a metal collar piece, B, is cemented. This collar is bored out to receive the long cylindrical vessel, C, like a chemical test tube in shape, supported by a metal the collar, B, is bored out conically, to receive a conical lid, D, which is screwed down by the cap-piece, E, the joint being rendered hermetic by the introduction of a ring of leather or caoutchouc, between the conical surfaces. The lid, D, has a central opening, into which is cemented the small glass vessel, F, resembling a hollow stopper from its shape and position. It is fitted with a conical plug, the spindle, G, of which passes through a small stuffing box at the top, and has a button attached outside. The stuffing employed is a disc or washer of leather or caoutchouc, which is compressed by the screw-cap, H. Into one side of the collar, B, is screwed a species of siphon cock, I, consisting of a plug valve, opened by the pressure of the finger on the external button, J, and closed by the action of a helical spring. The passage of this valve communicates with a tube, K, of small bore, reaching nearly to the bottom of the vessel, A. On the opposite side is another similar tube, L, descending to a like depth, and terminating above in a small rose, and in communication with the vessel, C, in which the gas is evolved. The manner of proceeding in using this apparatus is as follows :- The cap, E, is unscrewed, and the three vessels are se-

mercury, chlorate of potash, and sulphide of | ing through it, so as to exert a pressure on its antimony, the dangerous properties of which |surface, which, when the cock, I, is open, ingredients are diminished by the application | torces it up through the tube, K, and out by of collodion, which is used as a cement, and the spout, M, into the glass, N, placed to receive it.

> New Way of Checking Railway Baggage. The following method of checking baggage has recently been adopted with great satisfaction on two or three of the English railways When a train, say a down train, arrives at any particular station, a porter attends with a book. It contains tickets of stiff card board bound in the book. Each ticket is about three inches long and one inch wide. It is partly cut. So that two separate parts of it can be easily torn off. The tickets are numbered differently, but each of the three parts of a ticket has the same number. The outer part of the ticket has a loop of tape gummed to it. Suppose a person arrives at a station and is not going on by a train for an hour or two. or a day, and is desirous of leaving a carpetbag or a trunk at the station. He pays one penny, and in a moment the taped portion of a platform ticket is fastened to the handle of the carpet-bag. This portion bears, as has been already stated, a printed number also; the words "deposited at Winchester," or whatever the station may be, and likewise the words, "for down train." Another portion of the ticket, with the same number as the last, is torn off and given to the owner of the carpet-bag, to be presented at the station when the article is wanted. The words "for down train is omitted on this portion. The portion of the ticket that is left in the book corresponds with that given to the passenger, and is a check on the money-taker. The company then becomes responsible for the safety of the property. Luggage is divided into three classes-that for down train, up train, and to be left till called for, and should be sorted into three different compartments at the station.-For each division there is a separate book of tickets. If a person were to find or steal a ticket, and apply for property, he would be instantly detected, because he would first have to say whether the luggage was for up or down train, or to be left till called for which he could not do unless he owned it .-There is no necessity for any address to be on the luggage. One penny per package per diem is charged for a platform ticket.

A DIT IS NOW DEIOTE THE DITUST Farilament, for regulating the hours of factory labor, by preventing the running of machinery after certain hours. The hours of factory labor in England are much shorter than those in our country. Children under ten years are not allowed to labor, and those under 13 years are provided with educational means by their employers. The operatives in these factories are not so well paid as those in America, but their hours of labor are less by 12 per week.

Hot Weather.

On Friday last week the heat was so great in our city, that no less than 50 persons were sun struck. During the week we understand that about 200 persons lost their lives with the heat; they were nearly all foreigners, and mostly natives of Ireland. For thirty years no such excessively hot weather has visited our city. No less than 100 deaths by heat occurred last Sunday.

LITERARY NOTICES.

THE ENGINEER AND MACHINIST'S DRAWING BOOK

THE NEW ENGLANDER-F. W. Northrop, New Ha-ven, Ct.—The August number of this well known magazine and review is worthy of its high reputa-tion. The articles are chiefly on matters of interest at the present time ; we would commend to notice, particularly, the article on Layard's Discoveries.

HOUSEHOLD WORDS-A journal conducted by Charles Dickens: American edition published by McElrath & Barker, 17 Spruce street, N. Y. This publication has a circulation in Great Britain of about 90,000, and is gaining a strong hold in this country. Dickens, as a writer of prolific genius stands acknowledged before the world: human na-ture in all its phases he understands, and with won-derful facility he turns it into effective interest to his host of admirers. Terms \$2 perannum. Month-ly Parts, 25 cents.

MECHANICS, INVENTORS, AND MANUFACTURERS. SPLENDLD PRIZES.

The first number of the NINTH VOLUME of the SCIENTIFIC AMERICAN will be issued on the 17th of September, We are grateful for the very liberal encouragement which we have received from our readers, and take this occasion to express to them our gratitude. We are also under many obligations to our cotemporaries for favorable notices. The next volume will be commenced with new and beautiful type, printed on paper manufactured expressly for this publication, of greatly increased weight and finer quality : this item alone will increase our yearly expenses over \$3000; in addition to this we shall increase our present able Editorial force as it is our intention to continue the Scientific American, "THE LEADING AND MOST BELIABLE PRACTICAL SCIENTIFIC JOURNAL IN THE UNI-TED STATES." It will continue the unflinching advocate of all useful improvements, and it will fearlessly expose all unreliable and deceptive schemes appertaining to its character; [in this respect it has gained a reputation superior to any other work of the kind in the world.]

The opening of the CRYSTAL PALACE in this city forms an object of rare public interest; we shall devote a full page of the paper every week to careful criticisms, reviews, and illustrations of the objects most worthy of attention. We hope to render this department especially interesting to all our readers, whether they visit the Fair or not. The copious and FINELY EXECUTED ENGRAVINGS of Machinery, New Inventions, etc .- the FOUR HUN-DRED PAGES of valuable Scientific and Practical Reading-the USEFUL RECEIPTS-the full Reyort of all the PATENT CLAIMS, and the relia ble character of the journal on all branches within its field of labor-render it worthy of the support which it has so liberally received from its intelligent class of readers.

The circulation of the Scientific Arrayian during THOUSAND COPIES PER WEEK. The edition on the new volume will be commenced with twentythree thousand, which we feel confident will not be an over calculation. Subscribers, to ensure the numbers from the commencement of the volume, should send in their subscriptions early, as many were disappointed in not obtaining the complete set of the present volume.

The Scientific American is in form SUITABLE FOR BINDIND, and each volume is accompanied with a full Index of all the subjects, which renders it an ENCYCLOPELIA OF USEFUL, SCIENTIFIC, and MECHANICAL INFORMATION, for present as well as future reference.

Hoping to stimulate our readers to greater activity in spreading the circulation of the Scientific American, we offer the following Splendid Prizes for the largest list of mail subscribers sent in by the first of January next .—

\$100 Will be given for	r the largest list.
\$75 for the second la	rgest list.
\$50 for the third	ditto.
\$45 for the fourth	ditto.
\$40 for the fifth	ditto.
\$35 for the sixth	ditto.
\$30 for the seventh	ditto
\$25 for the eighth	ditto.
\$20 for the ninth	ditto
\$15 for the tenth	ditto
\$10 for the eleventh	ditto
\$5 for the twelfth	ditto
The cash will be paid to th	A order of the manual
leomentities to pute to the	o order of the success-

